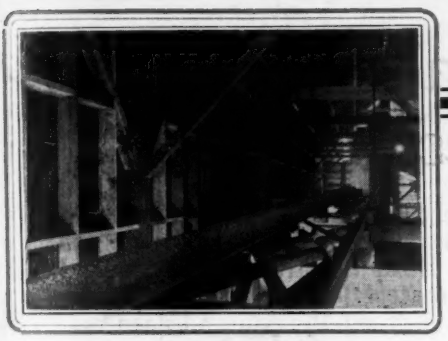
Pit and Quarry

SAND ▪ GRAVEL ▪ STONE

HANDLING ▪ CRUSHING ▪ SCREENING ▪ WASHING



Handling limestone at the plant of the Waukesha Lime & Stone Co.

Nothing for Repairs!

This is often the story of Sandvik Steel Belt Conveyor even after service that would have relegated the ordinary conveyor to the scrap heap.

Sandvik Belts are made of high grade charcoal steel, cold rolled, hardened and tempered—manufactured in lengths up to 350 ft. They are low in first cost and maintenance.

Full particulars in the "Sandvik Steel Belt Conveyor" Booklet.

Write us regarding your conveyor belt requirements

Sandvik

STEEL BELT CONVEYORS

SANDVIK STEEL Inc.
WOOLWORTH BLDG.
NEW YORK CITY

November, 1923

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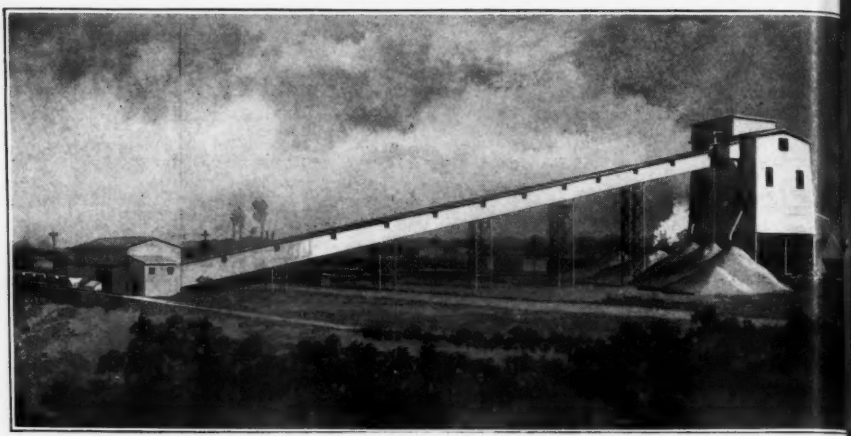

When a Labor Shortage Saves Money

Labor shortages are often the means of bringing plant executives to look into the economies of good conveyor equipment. Such an investigation quickly puts an end to their material handling problems, as a conveyor will always stay on the job and does more work at less cost.

Brownhoist belt conveyors will handle your materials rapidly and economically. Perfectly aligned idlers with roller bearings reduce friction to a minimum and eliminate the possibility of pulleys sticking. These features make both the idler and belt last longer.

For nearly fifty years Brownhoist engineers have been studying material handling methods. We can help you lower your costs as we have helped others. You will find that Brownhoist takes a personal interest in your particular job.

The Brown Hoisting Machinery Co., *Cleveland, Ohio.*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans

Products: Locomotive Cranes, Buckets, Belt and Chain Conveyors, Contractor's Bunkers, Etc.

BROWNHOIST

MATERIAL HANDLING MACHINERY

Pit and Quarry

Member Audit Bureau of Circulations
A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 8 CHICAGO, ILL., NOVEMBER, 1923 NO. 2

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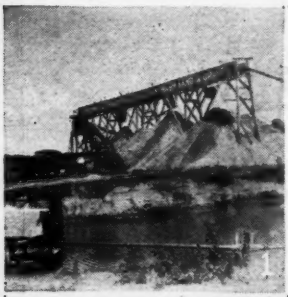


No. 1 shows a Barber-Greene which provides a flexible loading system for the Pipkon-Marggraff Company of Milwaukee. The Barber-Greene requires only one man and can load a truck with 5 cubic yards in 3 minutes. Further details below.

No. 2 and 3 show a Barber-Greene being used for stripping by the Continental Products Company of Caledonia, New York. No. 4 shows Barber-Greene U-Type Conveyor used for loading gravel by the District of Burnaby, Canada.

Providing a flexible loading system for washed sand and gravel

A washed sand and gravel plant in Wisconsin had a difficult loading problem to solve. Its sand and gravel are pumped from the adjacent pit and are finally discharged into storage piles. Each size, of course, is stored in a different pile.

Very often the sand in these piles, except that at the edges, is too wet to be sold. In order to load all the salable sand as soon and as fast as possible, an extraordinary flexible method of loading had to be found.

After investigating, it was decided to use a Barber-Greene.

It proved that it could load a maximum of 250 cubic yards of washed sand and gravel per day.

It proved that it could load a truck with 5 cubic yards in 3 minutes.

It is operated by one man. No help is needed; the automatic disc feed cleans up as it feeds.

In every way Barber-Greenes provide the flexible fast, economical system of loading that the conditions require. They move around under their own power to a pile where there is sand or gravel of the right size that is dry enough to be sold. They load as many trucks there as there is material available and then move on to another part of the pile, or to another pile, and load there.

There are, of course, many other methods of using Barber-Greenes in sand and gravel plants.

For additional information send for our sand and rock handling literature.

Also note photograph No. 4 showing the Barber-Greene U-Type Conveyor.

The base price on this conveyor has recently been reduced to $350.

Send for prices covering electric or gas engine equipment.

Barber-Greene Company, 490 W. Park Avenue, Aurora, Illinois

Representatives in thirty-three cities

BARBER GREENE

Portable Belt Conveyors — Self Feeding Bucket Loaders

Pit and Quarry

Vol. 8 Chicago, Ill., November, 1923 No. 2

Speeding Up Fall Work

As the winter months approach, the need for crushed stone and sand and gravel increases, due to the fact that many contractors speed up their work so as to finish before the winter weather commences. In road construction this is always the case, for a few state highway departments will permit the laying of concrete or bituminous macadam in bad winter weather, consequently the road builders put on extra forces and speed up their work and to accomplish the results they desire they must have extra supplies of crushed stone, sand and gravel. If the contractor cannot secure his supply from his regular quarry or pits then he will turn elsewhere to make his purchase.

When the customers of an operator speed up their work and demand extra supplies it behooves the operator to speed up his work also, to produce extra material. It is during the months of November and December that operators should work their plants to full capacity or over capacity if possible to supply the extra demand when it comes. Of course, if an operator is not selling all he produces, these conditions will not arise; but if his stock piles have been depleted and his sales equal his daily output, when this extra demand comes for more of his products, then the question becomes a live one and he must face it and solve it or lose sales.

There are two ways of increasing the output of quarry and pit plants. First is the one the writer would recommend to every operator. It is accomplished by studies made over long periods of time as to the speed under which men and machines can work without being fatigued or put out of commission, as well as by learning the capacity and output of men and machine. With this knowledge it becomes possible to increase the output of a plant. Excavators of various kinds can be served by additional men and equipment so as to materially increase their output. Additional transportation can be employed, while crushers and washer plants can be served so as to obtain from them their maximum production.

By this method not only can output be increased in most cases but overhead charges are likely to remain the same. The unit cost of production will be decreased, and thus, while the plant is producing more materials and selling more, an additional profit is earned.

The second method of increasing the output and also of further increasing the production after the work has been systematized as already outlined, is to work the plant at night, either a part of the night or throughout the hours from 6 P. M. to 6. A. M.

Without increasing the forces already employed it is possible to work some overtime, say from one to four hours and materially increase the output, yet allow the same men to do justice to their work during the ordinary working hours of the day. The objection to this comes from the fact

that men want extra pay for overtime. This extra pay may make the cost of production prohibitive. When it does and night work must be done, then the only alternative is to employ an extra force for the night shift, working the same number of hours as the day shift.

For night work there must be ample light. Plants that are already equipped with electricity will have little trouble in providing electric lights, while plants operated by steam can easily be provided with an electric lighting system. If this should prove too expensive, acetylene lights can be purchased. These may be moved from place to place and their cost of operation is small.

The quarry ledge should be well lit up so as to allow the men to break stone and to permit men and machines to load without trouble. Heavy blasting should not be done at night. All work of this kind ought to be completed during the daytime, although it is possible in case of an emergency to break up a few large boulders with explosives during the night shift.

If track is used for transportation during night operations it should be shifted before nightfall and fixed up so that no accidents or other trouble will occur during the night. The daylight is needed for such work.

The rest of the work that is done with crushing plants and in gravel and sand pits can be done as readily at night as during the daytime if ample light is furnished, and so placed as to give few shadows.

If a crusher is fed with regularity then as much stone can be produced during the night hours as during the day. The same is true of a washing and screening plant for sand and gravel.

If any repairs are to be made for machines, this should be looked after during the day. In other words if preparation is made for night work during the day shift, then a night force will help to pay dividends.

Cement Again Breaks Record

ACCORDING to figures of the U. S. Geological Survey just released production of Portland cement in September eclipsed all previous records for any single month. For the first time the 13,000,000 mark was reached, the exact quantity produced being 13,109,000 barrels. Production for the nine months ending September 30 was slightly over 101,000,000 barrels or more than was produced in any full year prior to 1922. Last year's nine months' record output was exceeded by about 24%.

Shipments from the mills during September, although less than in August, were greatly in excess of any corresponding month in past years, and were about 10% over September, 1922. For the first nine months of this year shipments were substantially in excess of 104,000,000 barrels, or 18% greater than during the corresponding months of last year.

Unquestionably the cement industry has made a remarkable record this year in taking care of the demands placed upon it. Starting the year with nearly 2,000,000 barrels less in stock than at the beginning of 1922 it has in nine months shipped about 16,000,000 barrels more than during the first nine months of 1922, and yet stocks in manufacturers' hands are more than 750,000 barrels greater than on September 30 last year.

A new $70,000 sand and gravel washing and distributing plant at Rainier Beach, Seattle, Wash., will soon be completed according to statement by H. F. Ostrander of the Seattle Sand and Gravel Co. A modern electrically driven screen is yet to be installed for the grading.

Lime Plaster Specifications

THE National Lime Association announces the publication of bulletin 305-A on "Standard Specifications for Lime Plaster."

The bulletin is the result of several years' study of field conditions and has been prepared in conjunction with representatives of the engineering and architectural professions as well as expert plasterers and producers of lime.

The specifications are in such form that they may be quoted directly and included in an architect's complete building specifications, or, if desired, the short form may be used and the contractor referred to the standard specifications.

The new bulletin is 8½ by 11 inches in size and marked for standard A. I. A. filing. Each specification is on a separate page and the arrangement is logical and simple. The bulletin contains only specifications.

Copies may be secured from the National Lime Association, 918 G Street, N. W. Washington, D. C., the Central Division office of the National Lime Association, Chicago Temple Building, Chicago, Ill., or the Eastern Division offices, Insurance Building, Washington, D. C.

Annual Missouri Valley Convention Date

AT an executive meeting of the Missouri Valley Association of Sand and Gravel Producers held at the Minor Building, Kansas City, Missouri on October 16, it was decided to hold the annual meeting of the association on December 17 and 18 at the Muehlebach Hotel, Kansas City, Missouri.

Slate Association Leader Dies

ON September 15, Charles H. Davis, president of the Davis Slate and Manufacturing Company of Chicago and director of the National Slate Association, died in Chicago.

Mr. Davis was born in Baltimore, Md., January 25, 1872, where he graduated from the public school and attended the Johns Hopkins University. For several years he was connected with the Bausch & Lomb Optical Company of Rochester, N. Y., after which he organized the Scientific Materials Company of Pittsburgh, Pa. He later took charge of the Overhead Line Material Division of the Westinghouse Electric and Manufacturing Company of East Pittsburgh. He entered the slate business in Chicago in 1914 and was actively engaged in it up to the time of his death.

Coming into the industry some nine years ago, he applied progressive ideas to the milling of electrical slate and became one of the important manufacturers of electrical slate panels in this country and Canada with several mills besides those of Chicago and Toronto.

American Cement in Greece

Under the Grecian customs regulations which have recently become effective, allowing the free importation of building materials to be used in the reconstruction of the portion of the city burned in 1917, a trial order of American cement has arrived. This cement was sold by the importer at a lower price than cement prepared in Greece. If consumers are satisfied with the quality, it is possible that a permanent market will be developed, unless exchange conditions again become so unfavorable as to prohibit buying in foreign markets and materials which are produced locally.

Cement Man Sails For Japan

HOMER M. HADLEY, district engineer in charge of the Portland Cement Association office at Seattle, sailed for Japan, October 5, to make a thorough investigation of how modern structures, particularly those consisting largely of reinforced concrete, withstood the recent earthquake.

Mr. Hadley is particularly well qualified for a mission of this kind, having for many years specialized in structural engineering. Before joining the forces of the Portland Cement Association, his practical experience included a number of years with some of the foremost engineering firms on the Pacific coast. Shortly before coming with the Portland Cement Association, Mr. Hadley was structural engineer for the Seattle School District.

Mr. Hadley's trip will probably require three months' or more absence from his official duties with the Portland Cement Association, although it is expected that very soon after his arrival in Japan he will be able to cable a condensed preliminary report that will reconcile a number of conflicting messages which have been sent out, leaving us thus far mostly in doubt as to just how modern structures in Japan withstood the earthquake.

The DeSmet Sand and Gravel Company have leased 10 acres of land northwest of DeSmet, S. Dak., and will operate a gravel plant. Machinery for the plant is already on the way from Spencer, Ia. Possibilities are that a Mason City, Ia., company which is short of material for its tile factory will build a factory in DeSmet.

The $100,000 cement mixing plant of Stine and Ellis, La Brea and South Monica Blvd., Los Angeles, has recently been completed. The plant has a capacity of 365 yards of mixed cement every eight hours.

Canadian Gypsum Production

The Dominion Bureau of Statistics issues the following finally revised statistics on the production of gypsum in Canada during 1922:

The total output of gypsum rock in Canada during 1922 amounted to 484,629 tons, of which quantity 145,954 tons or 30 per cent was calcined. The quantity quarried, by provinces was: Nova Scotia, 281,861 tons; New Brunswick, 56,692 tons; Ontario, 106,829 tons; Manitoba, 39,147 tons; and British Columbia, 100 tons.

For statistical purposes the production of gypsum is considered to be the sum of the quantities disposed of in the different marketable forms, care being taken to avoid duplication; the values used are those at point of shipment.

Shipments of all grades totalled 559,265 tons valued at $2,160,898, an increase of 172,715 tons and $375,360 over the 1921 production. The 1922 production included lump or mine run, crushed, fine ground and calcined gypsum sold; calcined gypsum used in the calcining plants for the production of wall plaster, alabastine and other gypsum products was also included. The average value per ton received by operators throughout Canada was, by grades: lump, $1.52; crushed, $2.26; fine ground, $6.22; and calcined, $10.67. Prices during the previous year averaged as follows: lump, $1.78; crushed, $2.56; fine ground, $3.42; and calcined, $10.61.

SHIPMENTS OF GYPSUM BY GRADES IN CANADA, 1922

Crude—	Tons	Value, $
Lump or Mine Run	350,650	534,160
Crushed	68,181	154,197
Fine ground	5,769	35,880
Calcined—		
Calcined gypsum sold	25,339	309,879
Calcined gypsum used in the manufacture of gypsum products, such as wall plaster, alabastine, etc. (Weight and value of gypsum content only)	109,326	1,126,782
TOTAL SOLD OR USED	559,265	2,160,898

SHIPMENTS OF GYPSUM, BY PROVINCES, IN 1922

	Tons	Value, $
Nova Scotia	332,404	580,148
New Brunswick	82,462	517,668
Ontario	110,227	621,668
Manitoba	34,072	440,914
British Columbia	100	500
TOTAL FOR CANADA...	559,265	2,160,898

Institutional Management of Workmen

THE crux of any labor question hinges around the number of hours to work and the question of pay, especially the rates and wages.

The number of hours, especially in operations like those of crushing stone and producing sand and gravel, must be fixed in order to keep the plant in operation. Even if stone is paid for by the ton and a man feels independent as to being bossed, yet he must understand that the full day must be worked if the plant is to be operated to capacity and at the minimum cost.

Thus whether men work by the hour of by piece work, it is necessary that the number of work hours be set and followed. There is a tendency today of making work hours too short, just as a decade or two ago the work hours were too long. At one time men went to work during the summer time at the break of day and continued until sunset. This meant a 12 to 14 hour work day, entirely too long for men and animals. With such periods of labor men could not do their best. For a few hours in the morning work is indifferent, and after about 6 o'clock the men to little if any work.

Nine and 10 hours is sufficient time for any man to do physical labor. Now the day in many places has been brought down to 8 hours. There is little doubt that in shorter hours a man is likely to put forth his best efforts, and there is a possibility that he will do nearly as much work as in the much longer hours.

The objection to the shorter hours is that in many cases in the country men have so much idle time that they become dissatisfied and thus are likely to leave the work. Then too, with the short hours less work is done than during a reasonable length day so that the overhead charges should be less than for an eight hour day.

Men are better pleased with themselves and their work when they do no have to work in the dark, and have some daylight to themselves.

With the work hours set the question of pay is all important. Various schedules of paying or rewarding workmen can be worked out. Naturally the most common method is to pay daily wages, and in some cases this is the only logical way; but the cost of production can sometimes be reduced and at the same time the earnings of the men increased by other methods of rewarding men.

Thus regular wages can be paid and a bonus offered for increased production. Such a bonus can be paid weekly, monthly, semi-annually or annually. Excellent results in some cases have been obtained by the bonus method, but the great objection to it is that the ordinary man does not have vision enough to wait to earn the bonus. Most men want to receive all their earnings in their envelopes on each pay day. In one case in the writer's knowledge a man was to receive a semi-annual bonus amounting to more than a hundred dollars within a month, yet he left the employ of the company to get an increased wage of 25 cents per day.

If it is possible to arrange a weekly bonus it works much better than one for a larger period of time for then the bonus for one week could be paid the next week; but at the best a bonus means much book-keeping.

It is possible, though, when the laborers are paid by some other method, to reward the office men and others on monthly salaries with a bonus. Such men have more vision than the ordinary laborers, and a bonus works much better with them.

One method of working a bonus for the common laborers is to pay them daily wages and set a task. Thus whether the task is finished or not the

man is assured of a day's pay if he works the full number of hours; but in order to have the workman put forth special efforts a bonus is offered for additional units of work that are performed. This means that a bonus is only earned by an individual putting forth special effort and exertion each day, and when it is earned it is paid promptly.

This method is partly day's wages and partly piece work, for the bonus must be earned by doing piece work after the daily task is finished.

Piece work has been mentioned and described in this journal a number of times during the past two years. The general method is known, but it has not always been successful, due to many reasons and faults, some due to the workmen and others to the employer. Rates paid for piece work must be fair to both sides and must not be changed unless by mutual agreement. When rates are being cut continually by an employer, the employes soon feel that they are being robbed. There must be some accurate way of measuring or weighing the units or else dissatisfaction will be the result.

This is true of any method of rewarding workmen, the employer must be fair and must be prompt in paying the men. If there are mistakes made these must be rectified and that without delay.

Today a man's business will stand or fall due to some extent upon the loyalty of the men in the organization. Without such loyalty a business may of some one man, but as a rule there hold together due to the great ability must be a harmonious organization if a business is to grow and gradually become a larger industry.

This means that the business has become an institution, and it is institutional management when men are paid more than a bare living wage, and treated fairly as to their reward and paid promptly.

It makes little difference what may be done in welfare work, or in furnishing men good homes or pleasant recreation, if the wage question is not handled properly and to the satisfaction of the employees, they will leave and it will be a continuous fight upon the part of the operator to keep sufficient help to run his plant.

Mica Deposits of the United States

In the present "electrical age" mica supplies a need not filled by any other substance. Its nonconductivity of electricity and heat and its toughness, flexibility, and elasticity make it invaluable in the electrical manufacturing industry. Before it was so employed it was probably used chiefly in glazing, for which large sheets of mica with perfect cleavage were required. Much mica that was then regarded as waste is now used in electrical and other industries by making it into "mica board," or built-up mica. Imperfect sheets of mica are also ground and used in the decoration of wall paper, in the manufacture of lubricants, in fancy paints, rubber goods, molded mica, and roofing papers, for covering steam pipes, and in many other ways.

The only commercially valuable varieties of mica mined in the United States, according to the Department of the Interior, Geological Survey, are biotite and muscovite. Biotite is a dark mineral, and its sheets are less flexible and elastic than those of muscovite. Muscovite is transparent or light colored when split into thin sheets. Mica mined for commercial use is commonly found in rough blocks, or "books," as they are called in the Western States. The outer shell of some of these blocks is partly crushed and broken and must be removed before the blocks can be cleaved into sheets. Many of these sheets are less than a thousandth of an inch thick, and some of the thin splittings prepared in India measure only about one sixteen-hundredth of an inch.

The Lancaster Gravel & Cement Products Co., Lancaster, Pa. has been incorporated for $40,000. Incorporators, William H. Stuckey and Carl R. Carling.

View of central portion of plant, housing conveyors No. 1, 2, 3 and 4. To the left the two primary crushers. Secondary crushers in large building at right.

A "Different" Crushed Stone Plant

Another large Wisconsin stone crushing company that has recently attracted attention by outstanding enlargements of its plant is the Leathem D. Smith Stone Company, located on Sturgeon Bay, midway between Lake Michigan and Green Bay. Costing approximately $150,000, this plant produces 2,500 tons of material daily from a tract of some 30 or 40 acres, and has a storage capacity of 30,000 tons. Located on the lake front, and having no railroad outlet, the Smith company ships entirely by water. As one approaches the plant from Sturgeon Bay, the immense arms of the steel roofed conveyors, mounted on bents set in concrete foundations, extending from the two-level quarries at the bluff on the right across the great heaps of material at a height of 100 feet down to the water's edge, give an impression of a large and practical quarry operation—which it is. The old plant had been long outgrown. The new one is the result of practical plan-building by the company officials.

"We have no blue print of the plant," said Secretary-Treasurer W. E. Behringer, when asked. "Only drawings, made here. Our president, Mr. Smith, laid out the entire plans himself, step by step, for the greatest possible efficiency and economy in operation and supervised its construction. And the plant is so built that space is reserved for enlargements, additional crushers and conveyors, whenever it becomes necessary to put them in."

Everything in both buildings and equipment is new and up-to-date,—crushers, conveyors, screens, shovels, and industrial cars and engines.

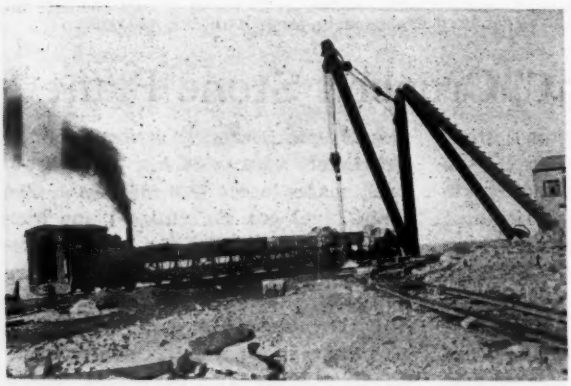
The quarry itself is being operated in two levels, stretching away to right and left at a retreating angle from the central point, at which is located the plant. The lower level is 50 feet high, the upper one 46 feet. The overburden is very slight. Two Sanderson-Cyclone drills are used in drilling, and du Pont powder in blasting. Two new No. 70 Bucyrus steam shovels of 2½ yards capacity, work continuously in the two ends of the upper level,

loading the waiting trains of Western side dump cars. These trains are hauled by one Baldwin 14-ton and one American 14-ton steam engine and one Whitcomb gasoline engine, to the central point at the cliff's edge, directly beneath which are located the big primary crushers.

By means of four crushers, two Worthingtons, one Austin and one Gates, two Robins grizzlies, eight Universal vibrating screens and 1,147 feet of conveyors, five sizes of crushed stone are produced, namely, 3½ to 2-in., 2 to 1¼ in., 1¼ to ½in., ½ to ⅛ in., and sand or screenings.

A No. 21 Worthington superior gyratory crusher of the short shaft type, rope driven by a 200 horsepower motor, takes stone up to 42 inches and crushes to 4 inch size. The rough material is dumped from the cars directly into the crusher from the track running along the edge of the second level. From this crusher the material is fed through a Robins adjustable grizzly into the next crusher, a No. 10 Worthington McCully, 22 inches, located about 8 feet below the No. 21 crusher's discharge spout, which reduces it to 2½ inch size.

From this crusher it is carried up conveyor No. 1, as it is called, a 36 inch belt of 150 foot centers, driven by a 40 horsepower motor, to a Robins cataract grizzly with 3½ inch square openings. All material sizing from 2 to 3½ inches goes on from here into conveyor No. 3, a 24 inch belt of 150 foot centers, driven by a 10 horsepower motor, and is deposited in open air storage at the end of this conveyor. Everything under 2 inches drops through the grizzly into the No. 5½ Austin and No. 6 Gates gyratory crushers down below and is reduced to the smaller sizes. It is then carried on conveyor No. 2, a 24 inch belt, 100 foot centers, driven by a 7½ horsepower motor, back to conveyor No. 1, which carries it up to conveyor No. 4 and this up to the main conveyor, from which it is dropped to the various open air storage heaps as shown in the illustrations.



Baldwin 14-ton locomotive, Western side-dump cars, at unloading point. Large derrick used in installation of crusher.

Bucyrus Model 70 Shovel loading Western dump cars, Baldwin locomotive to right.

No. 4 is a 30 inch belt on 167 foot centers, and is driven by a 25 horse-

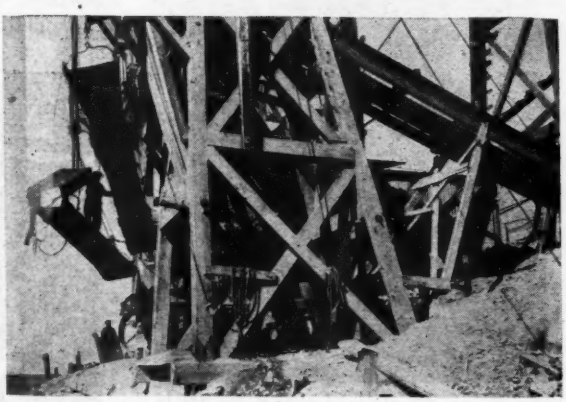
power motor. It is mounted on a framework about 60 feet high, whose bents are set on concrete foundations.

The material from the second grizzly, taken by conveyor No. 4, is smaller than 1¾-inch. This material is discharged into three Universal electric vibrating screens, two of them having 1¼-inch square openings, and the rejections are carried to the end of the conveyor where it is dumped into storage by a Stephens-Adamson automatic tripper. This conveyor belt, No. 5, is 24-inch by 100-foot.

The material which passes through the 1¼-inch screens drops to a third having ⅜-inch round openings. The product of this is then carried to storage over a 16-inch belt having 80-foot centers, which extends to storage. The larger material, from ⅜-inch up to 1¼-inch, is deposited on conveyor No. 6, located directly under and parallel with No. 5, which carries it beyond the discharging point of the 1¾-inch material and discharges into four other Universal vibrating screens.

These latter screens size the material into two classes,—⅜-inch to ½-inch, and ½-inch to 1¼-inch. Here the stone is also washed, as it is screened, with water supplied by a No. 4 American Well Works pump. The ½-inch to 1¼-inch stone is chuted to storage immediately beneath, while the smaller is carried by conveyor No. 7, a 16-inch belt on 60-foot centers, and discharged into storage.

View of left end of second level. Bucyrus No. 70 Shovel in distance.

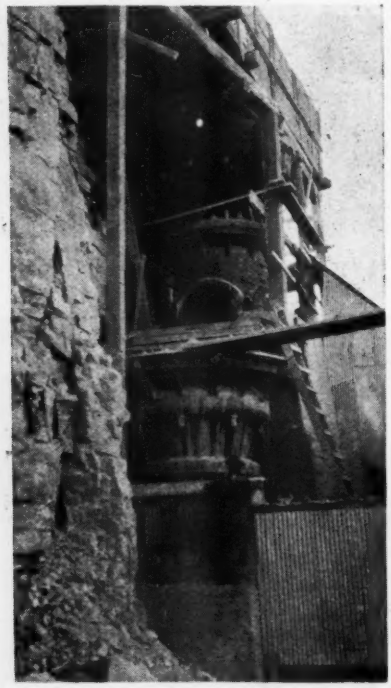


Unloading conveyors at water's edge, showing chutes folded up.

This system of large and small crushers and connecting conveyors—the latter are of Stephens-Adamson and Weller Manufacturing Company make, the belts Stephens-Adamson, United and Federal Rubber Companies'—constitute a continuous circuit which automatically carries and recarries the material through every required process of reduction and stores it in its proper place when finished, with no control or direction by human hands except the initial setting in motion of the machinery.

The storage of material is such that all sizes are located in a straight line. The loading operation is handled by

means of two 30-inch belt conveyors of 350-foot centers, which run parallel to each other in concrete tunnels underneath the storage piles from quarry to water's edge. These con-

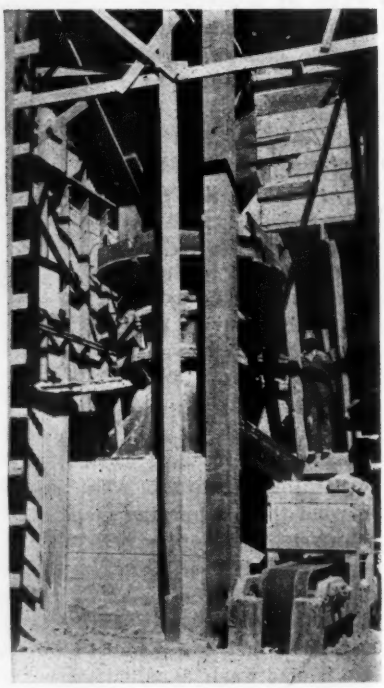


View of two Worthington crushers; No. 2 (42-inch) above; No. 10 (22-inch) below

veyors handle 300 tons each per hour and have a total daily capacity of 6,000 tons. These conveyors are driven by one 50-horsepower motor through clutches, and each conveyor can be operated separately. Gates with spouts are located about 15 feet apart and, at the dock end of the conveyors, chutes that are moveable in a radius of about 90 degrees and thus permit even distribution, discharge the material into the boat moored alongside.

The only product which is not stored in this direct line of reclamation are the screenings, which are deposited at one side. A 30-inch belt of 100-foot centers connects this storage with the main reclaiming conveyors, however, thus perfecting the efficiency of the entire system of handling.

The present 10-hour capacity of the plant is 2,500 tons, but the plans drawn up by Mr. Smith takes full cognizance of future requirements in the way of expansion. The present plant leaves plenty of room beside all its various units for the installation of additional machines without tearing down or replacing any of the present equipment. By installing such additional equipment, secondary crushers and separating equipment and by speeding up transmission and conveyor belts, the plant's capacity can



View of reducing crusher house containing Gates and Austin crushers.

be increased to 10,000 tons per day of 10 hours.

At the present time the Smith Company is supplying all the mate-

General view showing progress of material to water

rials being used in the new portland cement plant at Manitowoc, now in course of construction. So far, 12,000 tons have been supplied, and 4,000 tons more are to be shipped.

At one side of the new 35-foot storage down near the water's edge, part of the old plant and screens still stand. But this is rapidly being dismantled, and a Little Giant shovel is busily engaged in excavating and leveling away the rough earth on the old site. This earth is then hauled a short distance and used in filling in a depressed area lying between the crusher buildings and the water's edge.

The company owns two of its own carrier boats, and charters a third, and is planning to buy more. In addition to the crusher plant, the company also maintains two retail yards, one at Muskegon, Michigan, and one at South Haven, Michigan.

The officers of the company are: Leathem D. Smith, president; G. H. Smith (Mr. Smith's wife), vice-president; and F. H. Behringer, secretary and treasurer. Fred Lau is general superintendent.

More Magnesite Mined

Production Last Year Increased 32 Per Cent

The production of crude magnesite in the United States in 1922 was 32 per cent greater than that in 1921. It amounted to 63,487 short tons, valued at $650,742, according to figures compiled by James M. Hill, of the United States Geological Survey. Practically all the magnesite mined in 1922 was obtained from deposits in California, though a little was mined in Washington during the latter part of the year, and some calcined magnesite was shipped from stock piles at Valley, Wash. The largest producer of magnesite in California was the Western Magnesite Co., which operates the Red Mountain mine, south of Livermore, in Santa Clara county; the second largest producer was the Sierra Magnesite Co., whose mines and mill are near Porterville, Tulare county. The magnesite mines near Rutherford, Napa County, operated by C. S. Maltby, ranked third; and a small output was made from mines near Piedra, Fresno County, Sampson, San Benito County, Morgan Hill, Santa Clara County, Gustine, Stanislaus County, and Exeter, Tulare County.

Figures showing the imports of magnesite since the tariff act of 1922 went into effect (September 22, 1922) have not yet been published. The imports during the part of the year prior to that date amounted to 112,159 tons, valued at $1,757,636, as compared with 42,486 tons, valued at $592,491, in the whole of 1921.

No crude or calcined magnesite was exported in 1922. The exports of magnesia pipe and boiler coverings and other manufactures during the year amounted to 3,831,681 pounds, valued at $223,686.

More than 90 per cent of the domestic magnesite produced in 1922 was sold in the calcined form and brought from $30 to $50 a ton. A small quantity sold crude for chemical uses was priced at $10.50 to $12,50 a ton. The prices quoted on domestic magnesite were about $10 a ton throughout the year.

Los Angeles Rock Fight Ends

A long drawn out controversy over revision of specifications for crushed rock in Los Angeles city Specifications No. 125, was brought to an end by the adoption of a resolution by the city council instructing the City Attorney to draw an ordinance to make effective recommendations by City Engineer Griffin which will allow other rock than that which has heretofore conformed to the rattler test to be used in construction of the new Los Angeles outfall sewer.

Following is the revised text of the specifications as recommended by the City Engineer which is to be incorporated in the new ordinance.

"Rock shall be of clean, water-worn pebbles, crushed boulders, or quarried rock or a mixture of these.

"(a) Rock for concrete to be used in curb and sidewalks shall pass a 1½-inch screen; not less than 30 per cent nor more than 65 per cent by weight shall pass a ¾-inch screen and not more than 5 per cent shall pass a ¼-inch screen.

"Rock for all other concrete construction other than curb and sidewalk shall pass a 2-inch screen; and not less than 30 per cent nor more than 65 per cent shall pass a ¾-inch screen and not more than 5 per cent shall pass a ¼-inch screen.

"Rock for cement work of Class A concrete, when subjected to rattler test specified in paragraph (f) Section 23, Specification 125, shall not show loss of more than 42 per cent.

"Rock for all other uses unless otherwise specified shall not show a loss of more than 50 per cent when subjected to said rattler test.

"In addition to above specification requirements all concrete made from said rock shall be subjected to compressive test specified in paragraph (b), Section 20, Specification 125.

"(b) For bituminous pavements: Rock for use in all bituminous pavements shall be of sizes designated above and shall be uniform in quality and contain not less than 5 per cent by weight of pieces having rounded surfaces and when subjected to rattler test specified in paragraph (f) hereof shall not show loss of more than 42 per cent."

Investigation of Mineral Fillers

The investigation of the availability of certain minerals for use as fillers, together with a study of their physical and chemical characteristics, and their adaptability to commercial uses, is being continued by the Department of the Interior, through the Bureau of Mines. The South has extensive deposits of clay, ochres, bauxite, talc, graphite, etc., and the purpose of this study is to determine their value for use as fillers in making linoleum, paper and other commercial products.

The laboratory study of the size and character of grains of non-metallic mineral fillers has been completed. The results show that these characteristics have an important bearing on the applicability of a mineral filler and the types of manufactured products in which it can be used.

Laboratory work on Georgia and Alabama white clays to determine their value for filler use has been completed. The samples investigated included 31 Georgia and 11 Alabama clays. Of the Georgia clays, 17 were selected for more extended semi-commercial tests, and 500-pound samples were sent to the Ceramic Experiment Station of the Bureau of Mines at Columbus, Ohio, for washing, pulverizing and dispatching to the manufacturers who are co-operating in the factory are equal or superior in quality to the imported foreign clays now largely used in the paper trade. The bureau's tests also indicate the clays are of value in rubber filling, and rubber manufacturare are being furnished with samples of the Georgia clays, to test their value in rubber compounding.

Brazil, Indiana, newspapers are boosting limestone deposits in that vicinity and claim that an investment of $75,000 will erect suitable buildings and machinery to mine rich limestone deposits there. The limestone is the same quality as that now being worked at Greencastle, and in sufficient supply to last for several generations.

Valley Cement Products Company, San Jose, Cal., has incorporated for $200,000 to deal in cement and concrete products. Directors: S. L. Whalley, K. N. Stacy, W. Barnwell, T. Shermantime, and C. V. Whalley, all of San Jose.

Feeding Water to Boilers

NOW that a season is near closing and repairs are being made on the boilers at pit and quarry operations, it may be well to call attention to some of the economic methods of handling these boilers.

One thing about serving boilers to which little attention is paid except by the fireman, is feeding water to the boilers. During the past two years there have appeared in PIT AND QUARRY several articles on the preheating of feed water. This should always be done, even if only the exhaust steam is used for this purpose; but there are on the market a number of preheaters for boilers of various types.

But there are in use many boilers for which the water is not preheated, such boilers being fed by a pump or an injector. The manner in which an injector is handled can mean much, both in the life of the boiler and also in the coal bill.

Everyone knows that the water level in the boiler should never be allowed to be low; yet on the other hand it should not be too high, or at least so high as to cause water or moist steam to be carried through the steam pipes and into the valve chambers and cylinders. If this happens, not only is the lubricant for these parts carried away but it is possible to cause much serious damage by knocking out cylinder heads, injuring pistons and bending the connecting rods of the engine. Moist steam means a waste of fuel. The height of water should always be such as to give plenty of room to evaporate the water into steam, and have a sufficient supply in the boiler to do the necessary work called for.

Every one should know that to carry too low a water column will mean that the boiler can be injured by burnouts or excessive expanding of the metal, causing cracks and leaks, due to the fact that there is not enough water or steam in the boiler to counteract the intense heat of the firebox. The boiler should never be allowed to become red hot, and this can be prevented only by keeping the proper supply of water in it.

Water that is not preheated should never be injected into a boiler in large quantities. Steam is evaporated from water at 212 degrees Fahrenheit. Thus it can be seen that when a boiler is generating steam rapidly, if a large amount of cold water is injected into the boiler, the temperature that already exists can be materially reduced, so much so that steam will no longer be generated until the temperature is again raised to 212 degrees. It is also possible for the cold water to cause some of the steam that is already evaporated to liquefy and become water again. Then too, the cold water, if allowed to go into the boiler in excessive amounts, can injure the boiler plates.

For these reasons, water should be fed into the boilers at regular intervals; or if this is not possible at least at frequent intervals. If this is done, a large amount of water is not injected at one time, so that the temperature is but slightly changed. Of course the rate of taking water must be governed by the demands on the boiler, and the fireman should always be on the alert to take advantage of the opportunity to increase the height of the water when the machinery in the plant is not being worked to its full capacity. This means that at shut down periods the water column should be raised to its maximum height, so that steam can be easily generated from the hot water in a short period. If a fire is to be banked, an ample supply of water should be given to the boilers so that it will last over the banking period and furnish a supply of hot water when the bank is broken and it is desired to start steam in the boiler.

Water should be injected into the boiler before the fire is banked, and not after banking, otherwise the flues are cooled too rapidly, causing contraction without sufficient heat to counteract the effect of the cold water, which may result in injury to the tubes. The same thing can happen if fire doors are open too soon after banking a fire, as the cold air, thus introduced, can injure the tubes. The same principle applies to introducing water into a boiler, when fires are being cleaned. Thus water should be injected some time before the work of cleaning the fire is started, as this will allow the water to be heated enough to carry hot water and some steam through the period of cleaning.

Generally speaking, there are three water gages on a boiler, and a water glass. The glass should show half full of water, while the second gage should run water when it is open. This is sufficient water in a boiler when it is operated, and will leave space for the expansion of water. Popping off can be prevented by injecting water when necessary.

When water is fed into a boiler the injector or pump should be so regulated as to feed the water slowly. For this reason, for large boilers, a pump is preferred to injectors. A feed water pump should be slow acting, and of such size as to give a small supply in a minute. This will mean more pumping than when using one of larger capacity, but as already explained, slow feeding is desirable.

If these suggestions are followed, the life of the boiler will be prolonged, and there will be less repairing, while at the same time much fuel can be saved.

The Howard Material Company of Chicago, Ill., and Richmond, Va., purchased for $65,000 farm land at Rock, Wis., (305 acres) containing extensive gravel deposits. Activities will start at once.

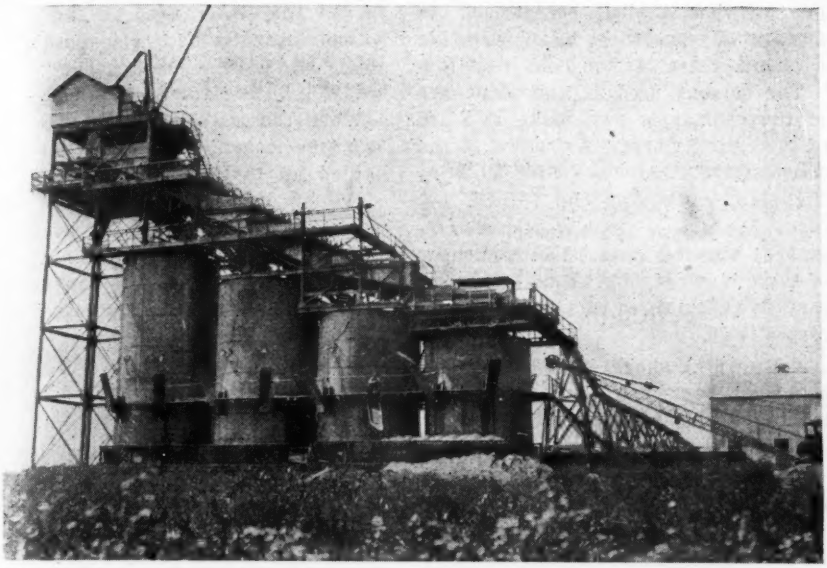
Sam Russell Directs Big Shot

WHAT is reported to have been the largest quarry shot ever made in the South took place recently at the Frazier Ballast Quarries at Frazier, West Virginia. It consisted of seventy-one well-drill holes varying in depth from thirty feet to one hundred and fifty-two feet. The holes were spaced sixteen feet apart and set back from the face of the quarry on an average of twenty-four feet.

The shot consisted of 42,000 pounds of duPont sixty per cent gelatin and about 17,000 pounds of Red Cross Extra, forty per cent dynamite. Cordeau Bickford was used throughout as detonator and trunk line connection used. About 250,000 tons of stone were well thrown down and material was well broken. The stone is crushed and used for ballast by the Chesapeake & Ohio Railroad. J. R. Anderson is superintendent of operation. Loading and firing was directed by S. R. Russell, of the technical bureau of the du Pont company.

Henry F. Koch of Evansville, Ind., has purchased the Mt. Vernon, Ind., plant of the Evansville Sand and Gravel Co., and expects in the near future to acquire two or three plants in that region. William Eichel, president of the Evansville Sand & Gravel Co. said the sale was due to his company accepting large contracts for gravel along the Ohio, Kentucky and Tennessee rivers, which require constant use of their two outfits.

Manistee, Mich., sand dunes are rapidly being shipped to the Atlantic seaboard according to a report of the Pere Marquette railway. During the last week of August 213 cars left Manistee for the east. The sand has a special value in foundries but at that, when some of it is lost, no claim is put in for the sand, the shippers merely asking a rebate of the shipping charges.



New Illinois Hundred Car Plant

ONE of the biggest of the new gravel pits in Illinois is that of the Illinois Sand & Gravel Company as Oswego. This company also owns plants at Rockdale, Plainfield and Elgin. At the Oswego plant, which is gear driven and has a capacity of 100 cars a day, ballast and commercial gravel is produced from its pits containing very excellent deposits which average about eighteen feet in depth.

Owing to the fact that the plant was built only last spring, and operations begun in June, the full capacity of 100 cars per day is not yet being reached. About fifty cars daily is the average, with 86 cars as the highest day's production so far secured.

A Page dragline excavator with a 4-yard bucket and a 100 foot boom is kept constantly at work loading the gravel into dump cars. These cars, of which the company owns half a dozen, are Sommers' 50 ton dump cars, made by the Standard Steel Company of Hammond, Indiana. These are standard gauge and are hauled up the grade from the point of operation, about a quarter of a mile from the plant, by a switch engine.

Five sizes of gravel are produced at Oswego, 2 inch, 1¼ inch, ⅞ inch and ⅜ inch material and torpedo sand. Two No. 5 and two No. 4 crushers are used. Regarding the working capacity and fineness of product of these crushers, the superintendent spoke warmly, saying he had been obliged to

Section of tracks, showing grizzly at unloading end.

General view of operations and track approach to plant.

put on a wider belt because of the amount of work they do, substituting a 24 inch for a 20 inch belt.

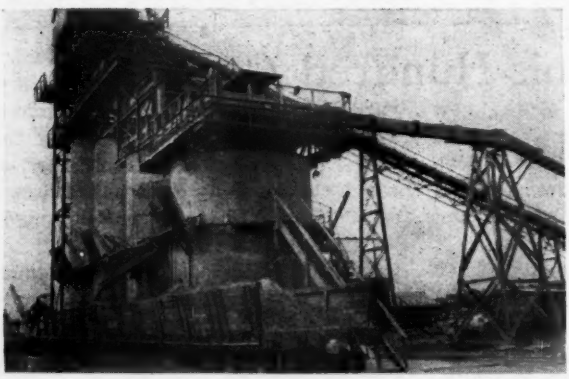
The screens used in the plant are of the company's own make and are of the cylinder type. As shown in the illustrations, there are four bins in the plant containing the 2 inch, 1¼ inch, ⅞ and ⅜ inch material (together) and the sand. The capacities of these bins are, approximately, seven cars, five cars, three cars and two cars respectively.

A Browning shovel with a 1½ yard clamshell bucket is used for special loading about the plant.

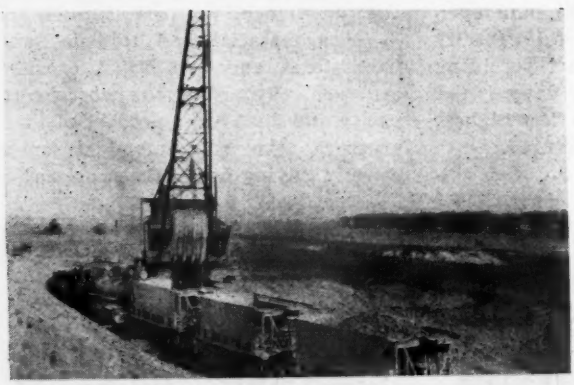
Since commencing operations in June many acres of gravel have been worked. Into this worked ground is turned the water used in the plant, which originally had been piped from the Fox River half a mile away through a 10 inch pipe.

When the material has been loaded into the cars by the dragline and hauled up to the main hopper, it is conveyed up the 36 inch main conveyor belt to the screens where it is separated, the coarse material going to the four crushers, the fine to the bins. After crushing, the coarse material is then returned on the 24 inch canvas belt to the main hopper in order to be re-conveyed on the large belt back to the screens. Here it is separated into the four or five grades as the case may be.

At present the material produced is being taken by the C. B. & Q. Railroad as ballast, though part of the output for a time was being used on road work as Oswego. When it is desired to keep the ⅜ and ⅞ inch material separate, the bins are subdivided by partitions.



End view of plant, showing cars loading.



Page dragline loading Sommers dump cars (handled by ordinary switch engine)

The conveyor machinery used was made by the Stephens-Adamson Manufacturing Company but, like the screens used in the plant, the conveyors are largely the results of the company's own experience and manufacture. These conveyors are on 270 foot centers. A 36 inch rubber belt is used on the main conveyor and a 24 inch canvas belt on the second.

The car storage capacity of the plant is 120 cars empty and 110 cars loaded. Gravity

loading is employed all the way. On a four-spur siding above the plant the supply of empties are kept, and these are released into the loading track beside the plant as needed. When filled, the cars are coasted on down to

Main belt conveyor to plant, 36 inch belt, S-A machinery

the superintendent's office where they are weighed on the track scales and checked by the clerk, and then shunted into another four-spur track until hauled away. Fifty-four foot railroad scales of 225,000 lbs. maximum capacity, made by the Strait Company of Kansas City, are being installed.

The company owns 160 acres of land at this site, all of which appears to

Hopper house at unloading point

contain excellent uniform gravel deposits. At present only one dragline is in operation, with one switch engine and three dump cars, and a total crew of twenty-five men. In the spring it is planned to put another dragline and engine and three more dump cars into operation.

The company has a large blacksmith and machine shop where all repairs are made, and in which the engines will be housed in winter.

Gravel Plant Rebuilding

Salvaging of the equipment of the Central Sand and Gravel Co.'s plant near Memphis, which slid into the river with a cave-in of the bank two weeks ago are going forward rapidly under the supervision of the officials of the firm, and with the completion of this work the entire $150,000 plant will be rebuilt just back of the old site on firmer ground.

The recovery of the cars, rails and shovels which fell into the river reduced the loss of the company to $50,000 from what was at first believed to be a total loss.

Lassig Limestone Quarry Corporation, Houston; capital stock $25,000. Incorporators; Oswald Lassig, Louis Lassig, E. G. Zachary.

DeSmet Sand and Gravel Co., Aberdeen, S. Dak.; capital, $75,000; incorporators, A. D. Neer, F. B. Robinson, H. A. Ditmanson.

The Federal Sand & Gravel Company, C. N. McNulty, L. B. Harrington and M. F. McNulty, incorporators; capital $25,000; seat of business Denver, Colo.

The interests of the Burbank Rock & Gravel Company, operating plant at Burbank and Roscoe, Los Angeles, Cal. have been taken over by the Standard Rock and Gravel Company.

E. B. Bradshaw of East Liverpool, Ohio, announces the sale of Line Island in the Ohio river, just east of the junction of the Ohio, Pennsylvania and West Virginia state line to Alexander W. Dann of Pittsburgh, who will level the island for sand and gravel production.

Polk County Rock-Clay-Sand Company has been incorporated at Bartow, Fla., capital stock $20,000, to manufacture rock, stone, clay, marl, sand, phosphate, lime, sulphates, fertilizers, building materials, lumber and other materials, etc. M. G. Riche, president and treasurer, R. C. Hatten, vice-president, J. A. Waddell, secretary.

Dolomite for Refractories

Research work on the utilization of dolomite in refractories is being continued by the Department of the Interior at the Ceramic Experiment station of the Bureau of Mines, Columbus, Ohio. The main problem being studied is to combine the lime in the dolomite so that it will be nonslaking and at the same time hold up the refractories, thereby rendering available abundant deposits of dolomite for extensive use as a basic refractory. Work previously done by the Bureau of Mines on different fluxes for rendering dolomite refractories non-slaking indicated that by careful selection and preparation, refractory bricks could be made, one of the best fluxes tried being alumina-iron flux. More recent work done by the bureau consisted of slaking time tests on varying proportions of dolomite mixed with an almuina-iron flux. The proportion of flux to dolomite was varied between 5 and 20 per cent. The refractory properties as well as the slaking tendency of these mixes were studied. After the best proportion of flux to ground rock was determined, bricks were made by the soft mud and dry press processes, using both organic and inorganic binders. Then methods of firing to produce sound bricks were studied. As a result, a composition has been found which, when compounded with the proper binder and burned after a given procedure, produces a strong, non-slaking brick of high refractoriness. The bricks are satisfactory in every respect, except that uniform shrinkage has not been completely attained. During the coming year, bricks will be produced and tried out in the industry.

S. S. Mongolian Prince from Elsmere Port, England, arrived at Los Angeles Harbor recently with 180,113 bags of English cement, the largest importation of cement made to a single dealer.

The State of Michigan is planning to extend its grand jury investigation of the alleged price-fixing combine of cement producers by calling witnesses outside the rank of producers. The state is seeking to show that cement is sold in the country where it is produced at the same price it can be had hundreds of miles away.

Iron In Crushers

In every quarry, through the carelessness of men, pieces of scrap iron, most of them small, but some of fair size, left lying around, are picked up with the broken stone and find their way into the crushers. Such metal pieces generally break the crusher, so that the plant must be shut down and repairs made. This is always expensive.

Every endeavor should be made to have all pieces of broken metal placed in a scrap pile to be sold from time to time, but even when this is done there will always be some pieces that will be allowed to go into the crusher, no matter how careful those feeding the crushers are to watch out for them.

With the very large primary crushers a small piece of iron, or a fair size piece, would not injure the machinery, for it would be able to pass through it without any trouble, but for secondary crushers a piece of iron, as small as a track spike or a small bolt, puts the machine out of commission, and it is seldom possible after material is passed through the primary crusher to pick out anything like a piece of iron between it and the secondary crusher. Consequently it is here wherein the greatest danger lies.

Fortunately there is on the market today an automatic device that will take out any metal that may get mixed with the partially crushed product before it enters the second crusher. This is a high duty magnetic pulley. This pulley can be arranged in connection with a belt conveyor chute or other traveling device that carries the stone from one crusher to another. It attracts and holds all metal, so as to separate it from the other product and thus prevents accidents from this cause to crushers.

Every quarry operator should be interested in this device and should investigate its merits with a view of adopting it. Injuries to crushers are not only expensive to repair but the whole plant comes to a stand still; production ceases, while expenses go on.

Builders Crushed Rock Products Company, Los Angeles—Capital stock, $250,000; shares 2,500; subscribed $700.

A Hold-Up

ONE of the editors of this journal was recently visiting a quarry, when about two o'clock in the afternoon the concaves dropped in one of the large gyratory crushers and the entire plant was stopped.

The superintendent was optimistic about his mishap. "We'll have the plant going within an hour to an hour and a half," was his remark to the master mechanic. "You take some men and get the concaves out and get your torch and burn the babbitt out, while I will get a lot of babbitt melted for you. It is fortunate that I keep plenty of supplies on hand, and got in a new lot of babbitt metal only last week."

To work everyone went with a hearty good will and within an hour the work of burning out the babbitt began; but within fifteen minutes the old hose on the torch had burst four or five times until it was absolutely useless. Hunt was made for new hose, then for some old hose, but none could be found. The superintendent and the office force had fallen down on their job, as a torch was useless without hose. Little more than five dollars of material or supplies was holding up the job. The quarry company was being held up, not at the point of a pistol, but by a torch, and by the men who were paid to prevent such a loss.

There was nothing to do but to put men to work with hammer and cold chisel chipping out the old babbitt metal. This the song of the hammer and chisel began and it continued into the night, and the weary men kept on through the dark hours before the dawn and on and on until ten o'clock the next morning, when the master mechanic was ready to pour his new metal.

Weary and eyesore men did this work and replaced the concaves slowly and tightened up bolts and wedges, instead of working with the pep and vim with which they started the job twenty hours before.

At one o'clock the plant started to crush stone again, but there had been about a hundred and fifty dollars of payroll to meet in that time without any production. Thus money was lost in two ways: a loss in sales and profit, and a payroll without production.

This was all due to not being prepared for accidents. During the late World's war we all heard and talked much about preparedness, and it was impressed upon the nation, but the lesson learned then at tremendous cost has quickly been forgotten. Yet it is as important today in business as it ever was. To be forewarned is to be forearmed and ready for any emergency.

Many business men claim that they are always prepared, and tell how they keep parts of machines on hand and many supplies. This is true of pit percentage of the cases they do as to and quarry operators. And in a large larger things, such as pieces of machinery and other important items, just as the superintendent in question had several thousand dollars' worth of such supplies on hand and remarked how fortunate he was in having a good supply of babbitt metal; yet he had allowed his hose to become so old on his torch as to be worthless and had not the forethought to have a new piece on hand. Hose at its best is not of long life, and especially when it receives as rough treatment as it does around quarries.

There should always be a supply of such things on hand. Just to say this means nothing, but it should be the business of some one to see that these things are purchased; and a second man should be appointed to see that a check is kept on the first one. Then at frequent intervals an inventory should be taken and this checked

against a list of supplies and materials that should be purchased from time to time.

This may seem like a lot of work, but if attended to each day or week will consume but little time, and it may mean the prevention of losses in a month that can total hundreds of dollars and possibly a thousand or more.

To be successful in business, and especially in the pit and quarry line, where so many things can happen to cause setbacks and losses, one must be eternally vigilant and be prepared for every emergency. For five years a blast may not cause any damage, yet during the next year several machines may be put out of commission by a few blasts. Hence all machinery must be protected in the best manner possible from blasts.

Be prepared and you can't have expensive hold-ups and your profits will increase accordingly.

Regrets

Too many business men have their regrets after they have lost money or spent money uselessly. It is rather a strange characteristic of most people that as soon as some one suggests or shows them a machine that is better than the type they are using, they become antagonistic rather than judicial, willing to hear about the new machine and, after weighing and considering all facts, to decide whether or not the device is worth using.

One business man writes, "My only regret is that we did not install your machine years ago to effect the saving they have made for us."

Another operator says, "We believe it safe to say that we would have saved thousands of dollars if we had put this outfit to work three years ago."

Many similar quotations can be given showing how operators have installed machines that have been on the market for years and then regret that they had not purchased years before.

The writer has been both a purchaser and a seller; so he knows both sides of the question. Naturally a salesman always wants to sell, but many salesmen know that their best sales are made when they give the greatest service. Few good salesmen want to sell machines that they know will be perfectly useless to the purchaser.

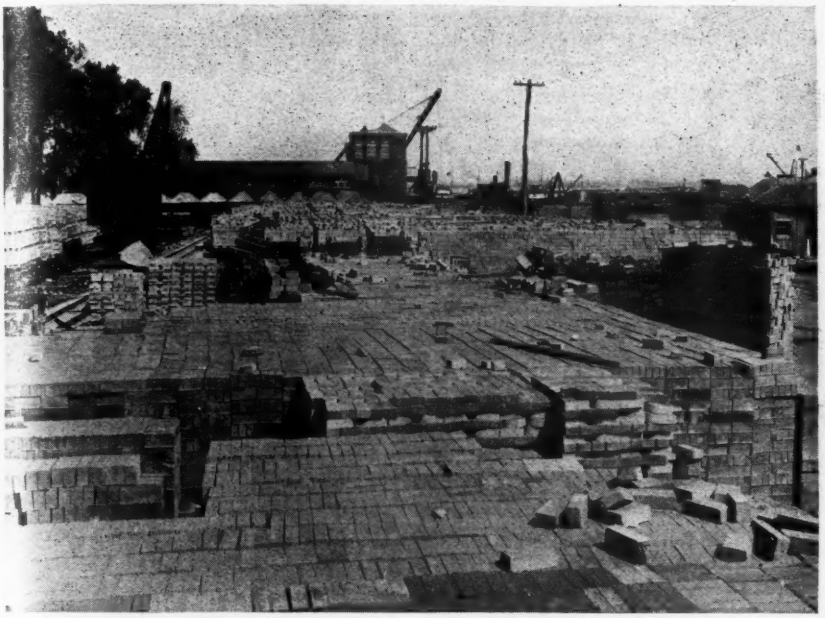
However, even when it is evident that a machine will save a customer much money, the prospect will argue that his conditions are different and he cannot use the machine in question to any advantage, and so on through a long list of objections, not one of which may be valid or anything more than a stall, to get rid of the salesman. In most of these cases the customer is doing more injury to himself than the salesman.

The writer remembers, how some years ago, a highway contractor told him that he had been in the business nineteen years and that only for five years had he operated steam shovels. It took only one year to show him how foolish he had been in turning down shovel salesmen year after year, believing that his jobs were too small for steam shovels. He regretted his action, for he believed he had lost by his own lack of knowledge and judgment many thousands of dollars. This was his great regret.

Manufacturers spend thousands of dollars yearly to tell prospects of their machines and what they are doing for others, yet too many business men pass these advertisements by with little attention or thought. Many of these same business men believe that every salesman has a fish to fry and thus pay little attention to what he may say. The men who act in this way will later have regrets and many of them.

No one can purchase everything that is offered to him, but he can always be in a receptive mood and learn everything possible about any machine called to his attention. Then after careful investigation he can decide whether or not he can use a certain machine. If this method is followed, many men would find they would save thousands of dollars in their business and they would have fewer regrets.

The Kinney Sand Company, Benton Harbor, Mich., incorporated for $40,000. Incorporators: P. M. Kinney, president; C. M. Niles, vice president, and Vere Beckwith, secretary-treasurer.

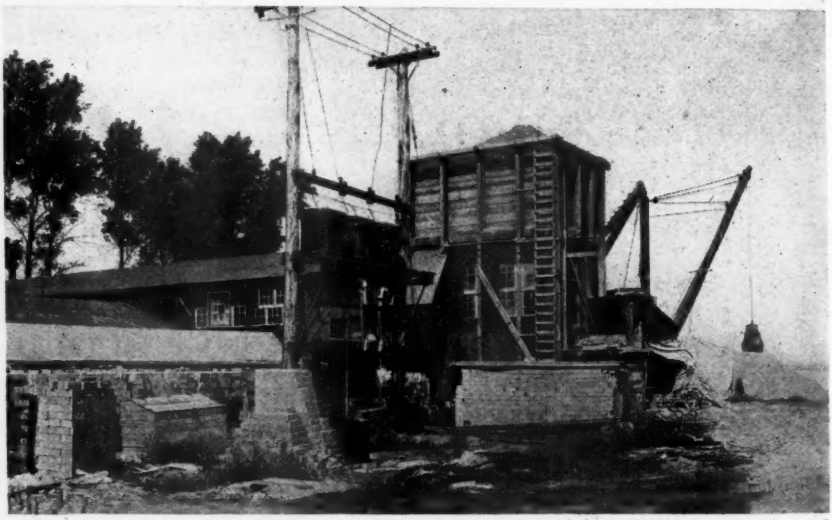


How Shope Concrete Bricks Are Made at Baltimore

"I KNOW of no more uniform product than Portland cement," said Mr. Lawson L. Wagner, president of the Arundel-Shope Brick Co., of Baltimore, Md., to the writer on a recent visit to his plant.

"Not even are drugs made with more care and put through a greater number of tests than Portland cement. You know yourself that in manufacturing cement the standards of three national associations are followed. These are: The American Society of Testing Materials, the Cement Users Association, and the Portland Cement Association, the manufacturers' own organization. Thus three standards are followed, namely, that of the engineer who specifies, that of the man who uses and that of the man who manufactures. Thus I maintain that if the other products that enter into the making of concrete are kept up to a standard, any article made of Portland cement concrete must be one of superior quality.

"Knowing these facts, when I started this business, more than a year ago, the first man I employed was a cement testing engineer and chemist for I had fully resolved that all bricks made by the Arundel-Shope Co. should be of quality production. With an inexpensive laboratory, we test not only all of our raw materials, but make frequent test of our finished brick. Each carload of cement and each scow load of sand and gravel is tested and, although we purchase our sand and gravel from an affiliated company, yet we condemn every shipment for use that is not up to our standard. Contrast this with the making of brick from other products, where neither the materials nor the bricks are tested and you can see that we



Stock pile derrick, bins, mixing plant, brick making sheds, kilns.

are making a superior product. Our whole object is quality production and the success of the past year has justified the expenditure that has been made to obtain results."

These facts were impressed upon the writer as he entered the Baltimore office of the plant manufacturing concrete bricks under territorial rights under the Shope patents and, in going from the office and laboratory, through the plant, and the successive stages of manufacturing and curing to the loading of the trucks and hauling from the yard, these facts were substantiated, for the bricks produced were of excellent quality.

Before the plant was built a concrete slab or floor that covers nearly an acre of ground was first laid. The entire plant and storage yard is protected by this concrete floor.

The products used in manufacturing these brick are one part of Portland cement, two parts of an especially graded fine sand, and four parts of gravel. The gravel is washed and screened so as to run from ⅛-inch to ⅜-inch in size, only a small part of the individual gravel running to ½ in one dimension. The sand is graded from ⅛-inch down. Fortunately for the brick company, the Arundel Corporation, from whom they obtain their sand and gravel, is dredging from a field adjoining the plant an excellent grade of sand and gravel, that runs in proportion of one to two. At present the dredge washes and screens the sand and gravel and delivers it in scows alongside the plant. Here a stiff leg derick operated by a Lambert Hoisting engine with a Cutler-Hammer electric control picks up the sand and gravel by means of a Hayward 1-yard, clamshell bucket, from the scow and dumps it into a bin over the mixing plant. This entire plant, with the exception of the locomotive crane, is operated by electricity and plans are now being made to motorize the crane.

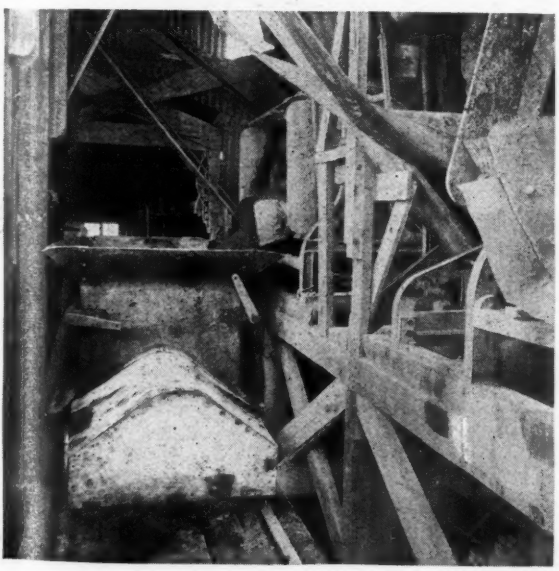
Arrangements are also being made to build a slip and dock alongside the derrick and mixing plant. Here, too, a new screening and washing plant is to be located so that sand and gravel that has not been previously washed and screened can be used. The scows furnishing the sand and gravel hold

about 300 tons, which is a day's supply for the present plant. The derrick handles the materials from the scow to the bin, placing all excess in a stock pile from which it is rehandled to the bin. Alongside the mixing plant and located on the ground is a cement bin. The cement is brought from the storage warehouse and emptied into this bin. Two bucket conveyors carry the cement to a second storage bin at the top of the building. Thus all the products are stored for mixing above the mixing plant.

The mixing plant consists of two half yard Bystone Concrete mixers. These are located side by side. Above each is a hopper having a capacity of 12 cubic feet. By means of automatic gates on the bottom of the sand and gravel bin these hoppers are filled with the aggregate and dump their loads into the mixers. A hopper holding two cubic feet on a swivel arm goes under the cement bin and is loaded through a gate. There is one of these hoppers to each mixer. The overflow of the cement is caught by a hopper bin directly under the discharge and from this bin it is dropped into the lower bin where it is again picked up by the bucket conveyors and carried to the upper bin. By means of the swivel arm on the cement hopper it is swung around over the mixer and the cement is discharged into the latter. A water pipe above the mixer furnishes water for the mixing.

Thus one man feeds, mixes and dumps his mixer. He first loads the mixer with sand and gravel and dry mixes for about a minute, then water is added and the machine mixes for two minutes, when it is dumped. With two mixers a batch can be produced every minute and a half. The concrete mixture seems dry, but it is amply wet for the Shope brick machines, as the tampers bring water to the surface and allow the Shope process of finishing the brick to be carried out successfully.

On a track immediately below the mixers there is operated a car which has a capacity of ½ a cubic yard. This car was built by the company itself. Electricity is furnished by a wire between the two rails. The car has in it a movable metal slide that can be thrown from one side of the car to the other, thus dumping the entire load on the side of the car opposite the one upon which the slide is placed. By changing this slide the car dumps on either side at the will of the operator. The motor and the operator's platform are all on the same set of trucks. The car is very condensed and takes up but little room on the track. The track upon

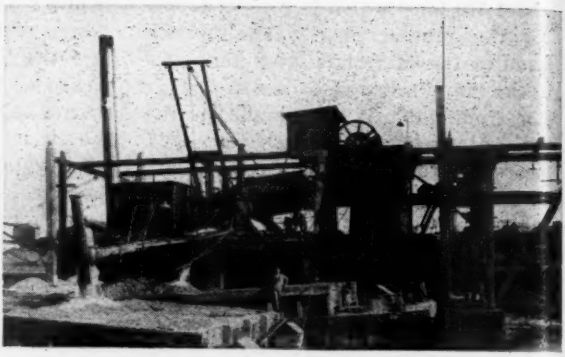


Bystone mixer dumping into Larry car.

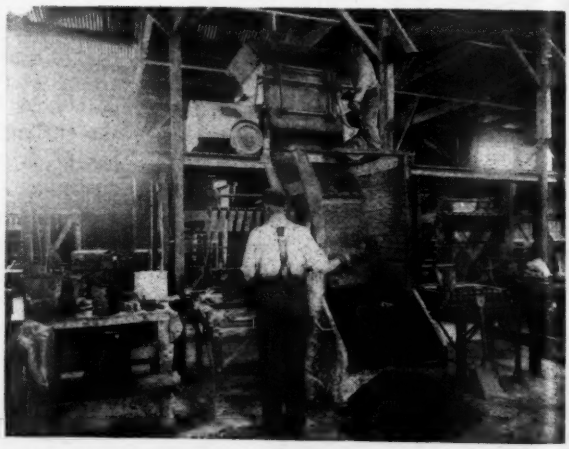
which this car operates runs from below the mixers into a building adjoining the mixing plant upon an elevated track, below which are located 20 Shope concrete brick machines, ten of which are located on either side of the track. On one side are the machines making common brick, while on the other side special face bricks are made. The car dumps its load into 20 wooden hoppers, one located alongside each machine. From these hoppers the machine operators, by means of shovels, take the concrete and put it into the machine.

The mixing plant, bucket elevators and car are operated by a 20-horsepower Westinghouse motor. This is all the power the plant uses with the exception of the locomotive and stiff legged derrick previously mentioned.

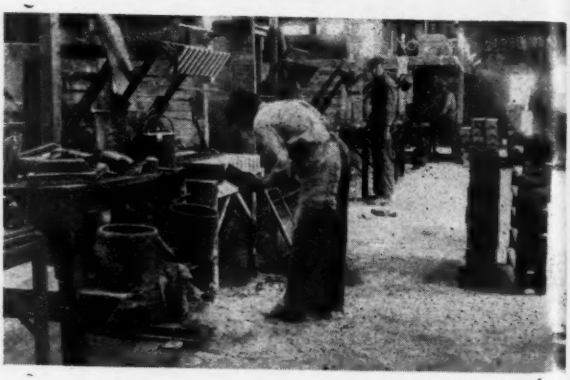
A self-spacing wooden pallet is used in the machine to make the bricks upon. As the bricks are manufactured these pallets, which hold 10 bricks, are taken out and stacked up. The pallets are termed "self spacing," as two blocks, a little larger than the bricks are placed under either end, and thus, as the pallets, with bricks upon them are piled up, they are so spaced by



Dredge that furnishes sand and gravel.



Larry car dumping into hopper beside Shope machine.



Finishing face brick on Shope machine.

these blocks as to prevent the top pallet from resting upon the bricks.

As the bricks are made and taken from the machine they are stacked on the pallets 9 high. The machines make a brick 2¾ inches by 4 inches by 8 inches, 10 bricks being made at one time. Thus a stack of pallets 9 high holds 90 bricks. A truck made by the Shope Company picks up these stacks of bricks, and a man runs them into the kiln. This truck is especially designed, with 2 wheels having rubber cushion tires on them. The truck goes under the bottom pallet picking up the pile easily and without jarring it. By means of these trucks the bricks are in no way disturbed in obtaining their initial set. This is essential to good concrete brick making. The bricks are carried into the kilns in this manner and, when properly cured, are carried into the storage yard in the same way. This shows the need of the immense concrete slab under the plant and the storage yard.

Loading face brick in patented truck body.

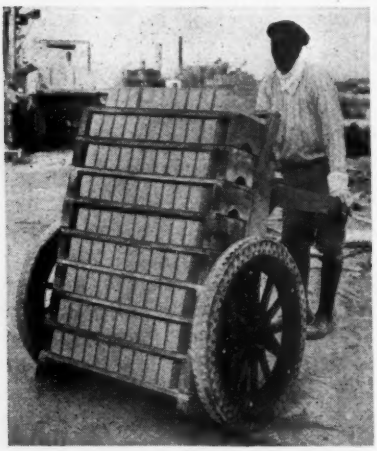
Note steam and spray pipes in kiln.

The curing of the brick is done in 11 kilns, each kiln handling 17,000 bricks. If warm foggy weather predominated, kilns for drying would not have to be used, for such days are ideal for curing but, inasmuch as this kind of weather occurs only at rare intervals, it is necessary to manufacture weather conditions. This is done in the kilns.

These kilns are built on concrete brick, the wall being built of hollow construction. The roof is made of concrete and is gabled. This type of roof is absolutely necessary so that, as the moisture in the kilns congeals, it will run down the slanting slope of the roof to the side walls and thus to the floor, without danger of dropping from the roof or side walls on the brick, thus injuring them while they are being cured. In the hollow side walls a rainspout is run at the base and is kept filled with water. In this water is a perforated steam pipe furnished with steam from an upright boiler. The escaping steam through the water drives through holes made in the wall or left in the wall a warm, moist vapor that cures the brick in 48 hours, after which they are taken from the kiln and, still remaining on the pallets, are placed in one section of the yard where, for 5 days a spray of water from an ordinary garden sprinkler is allowed to play upon them. This prevents the bricks from drying out too quickly and prevents air cracks.

Preparations are now being made to

change the methods of introducing steam into the kilns through a small steam line near the apex of the roof. At frequent intervals a small nozzle similar to the kind used in spraying trees is being used in the line. This



Handling brick to and from kilns.

will cause a smoke-like vapor of steam to float through the entire kiln and it is believed that this will cure the bricks better than the present arrangement.

After the bricks are cured, they are carried to the storage yard, removed from the pallets by hand, and stacked in piles or units of 500. These piles are supported on brick turned on the edge with 4 to 5 inch spaces between them. An especially constructed bucket, the bottom of which consists of arms that go into these spaces under the 500 pile units is used with the locomotive crane to pick up the piles of brick. The locomotive crane running on the track stores them at suitable places in the yard, to a height of about 10 or 12 feet. The crane again picks up these piles by means of the bucket and dumps them into trucks for delivery.

In connection with the Brownhoist locomotive crane there is used some industrial tracks and small cars in the storage yard to handle the bricks. Turntables for these tracks made by the Canton Foundry Company make a flexible system of storing and rehandling the brick.

For manufacturing the brick the company is now using Tidewater, Bath and Saylor cement. To make the face brick Atlas white cement is used and a large number of different kinds of coloring materials.

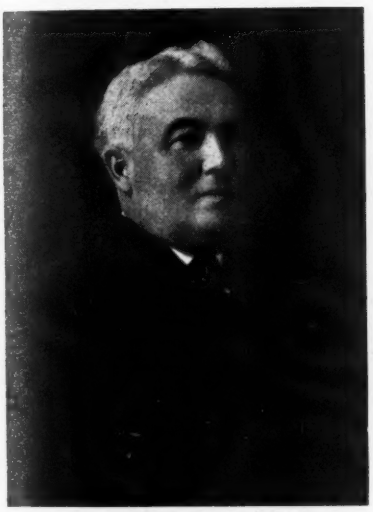
It is these facts that have made the Shope concrete brick so successful—that this company, with its limited plant, has sold more than 4,000,000 brick in less than a year. Business for twice this amount is in sight and, no doubt, the plant will be enlarged. Clay bricks have had prestige in building construction for more than 5,000 years but concrete bricks have won their place in the arts and trades, and sand and gravel operators now have their opportunity of manufacturing and selling a finished product, instead of marketing only raw materials. Everyone with experience knows that, in most cases, there is more money to be made and larger profits earned in

Shope brick at left, showing greater bulk than clay bricks.

making and selling a finished product than in producing only raw materials. It is for these reasons that large corporations such as the Arundel company are engaging in the manufacture of bricks under the Shope patents

Build Third Plant at Same Quarry

AMONG the new stone crushing plants of Wisconsin is the large, fully equipped plant of the Lutz Stone Company at Oshkosh, Wis. One hundred acres of fine blue limestone lie ready for quarrying on the Lutz property, which company since the year 1867 has been actively engaged in producing stone for the market.



Robert Lutz, President
Lutz Stone Company.

From the beginning of Lutz history to date three stone crushing plants have been built. The first, dating back to 1867, was a simple little affair equipped with a single No. 3 crusher, and turning out stone in "retail" quantities. With the passing of time, however, the demand for stone increased and it became necessary to replace the original plant with a larger one.

This second and larger plant (which is still visible on the far edge of the quarry in the accompanying illustrations) was equipped with a No. 3 and No. 5 Crusher,—but still the stone was broken by hand in the quarry.

In the spring of 1923 came a radical change. The old plant and all the old equipment was put entirely out of commission and a complete new plant was built with full equipment, new and up-to-date in every particular. The new plant, which cost $100,000 to build and required 165,000 feet of timber, is entirely electric driven. It turns out 500 tons of crushed stone a day and has a possible daily capacity of 2,000 tons. The storage capacity of the plant is 600 tons.

In the small latticed house before the plant building (see illustration) is the substation in which electricity is received at 4,000 volts and stepped down to 220 volts.

The stone produced at Lutz's is in four sizes, namely: 1¼ to 1¾ inch, which is used for road work; 1 inch, clean, used in town work; ½ inch, clean, used in asphalt work; and crusher sand. As evidence of the big demand for this plant's products is the two electric searchlights, with which two lectric searchlights, with which recently they have been working night shifts, and turning out double capacity production.

It is very evident, even to the most casual visitor, that Robert Lutz, president, and Richard W. Lutz, secretary and general manager of the company, have made a 100 per cent job of rebuilding and replacement, for every building, car, truck and shovel is "brand new," and agreeably efficient and handsome. A quarter of a mile from the plant stands the new office and garage buildings, in which are housed the "office end" of the business, the trucks and the horses.

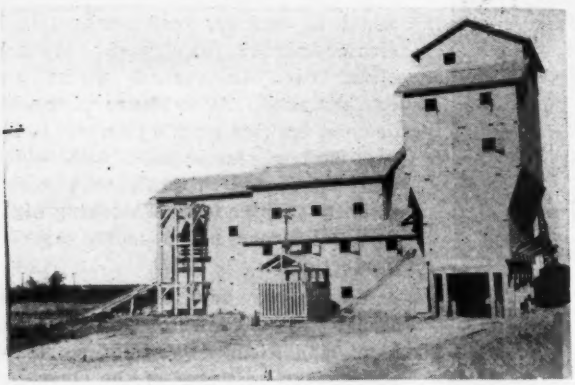
Looking down the elevator tracks from the plant into the quarry, and the rails are 56 pounds standard gauge, a rather attractive quarry operation is visible. Some eight or ten acres have thus far been worked. At the extreme left an O Type Thew elec-

tric shove, ¾ yard, is loading material into a string of Kilbourne & Jacobs 4 yard side dump cars. An Ingersoll-Rand drill operated by a Type ER-1 Ingersoll-Rand compressor driven by a 30-h.p. motor, is busy breaking up rock. There are 8 of these cars, and an Adamson locomotive does the hauling to the switch in the center, where the cars are pushed forward to the foot of the incline and drawn up into the plant by the elevator cable. Across on the opposite side the old crusher plant still stands. At one side of the new plant a Barber-Greene loader is used in reloading crushed material from the ground.

Lutz Office, Garage and Barn.

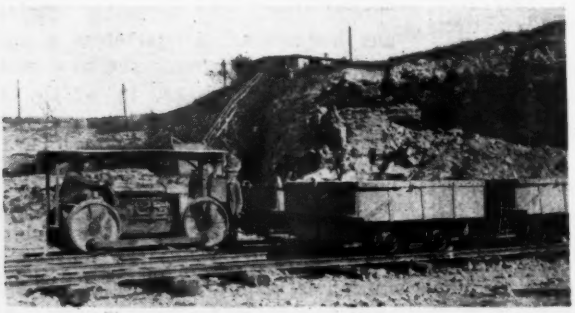
One great advantage of the new plant with its superior co-ordinated arrangement and organization is that it requires a force of but 7 or 8 men to operate.

The plant is Allis-Chalmers equipped throughout, all motors and machinery, with the exception of the one 30 horse-power Westinghouse motor, which drives the Ingersoll-Rand Type E R 1 compressor, being of this make. All machines are also driven by individual motors.



Side View of plant, showing electric receiving house where 10,000 H. P. are received and stepped down to 2,200 H. P.

There are 3 Allis-Chalmers crushers, A No. 12 style N, a No. 5 K and a No. 3 D. For use in elevating and lowering the large No. 12-N crusher or parts for repairs a 16 ton Yale and Towne triple chain block and suitable crawl hangs at one side ready for immediate use. With this chain block the big crusher was first installed.

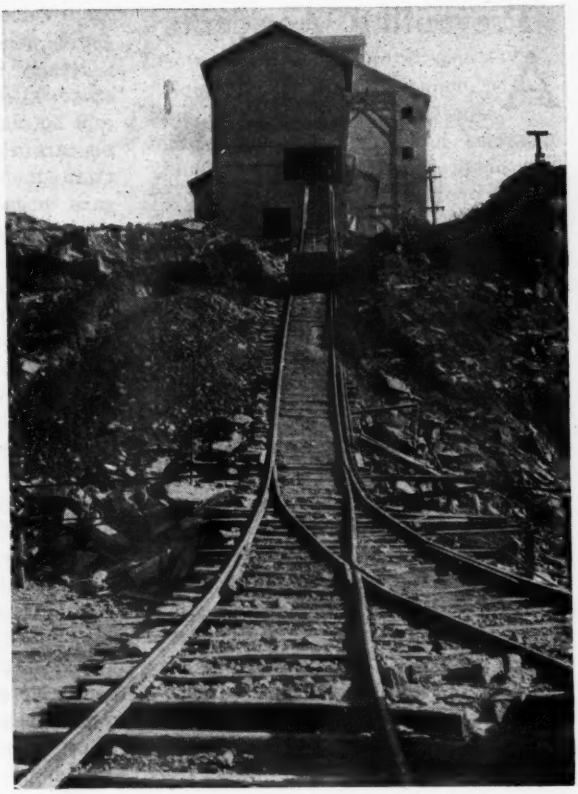


Adamson locomotives at work switching Kilbourne & Jacobson cars at bottom of approach to plant.

From the No. 12 Style N Crusher a No. 12 Style B elevator with 49 foot center carries the material up to a 48 inch by 12 foot revolving scalper screen. From this screen everything under 1¾ inches drops to the No. 8 Style B elevator with 77 foot center; everything over

1¾ inches goes through the No. 5 K crusher and then out the No. 8 B elevator. These products then go up the No. 8 B elevator to the 48x24 revolving screens and are sized. All that passes through the ½ inch dust jacket drops into a 5x10 shaker screen, which sifts out the sand; the balance is graded to 1 inch and 1¾ inch material, and drops down into the storage bins below.

Loading is done by gravity. As shown in the illustration, motor trucks are driven under the bins and loaded simply by the pulling of a hand lever above. Freight cars in similar manner are loaded on tracks immediately besides the bins, by means of side chutes. The company uses 3 Packard motor trucks for hauling.



Incline to Lutz plant, showing empty car coming down to quarry.

There are nine electric motors; one 125 housepower, 865 r. p. m. slip ring motor; two 50 horsepower, 865 r. p. m. slip ring, one for the plant's double friction single drum hoist, and one for the large elevator and screen; two 40 horsepower motors, one for the No. 12 elevator and one for the No. 5 crusher; one 25 horsepower motor for the No. 3 crusher; one 10 horsepower motor for the shaker screen; one 50 horsepower motor for the plant's American Centrifugal pump, (8 inch suction, 1,500 gallons per minute), and one 30 horsepower Westinghouse motor for the Ingersoll-Rand Type E R 1 compressor.

Stock Yard showing loader and one of Lutz's Packard trucks.

It is of interest to note also that a complete cost system, installed by Messrs. Lamb, Graham & Co., is in operation and by its means an exact record of every operation is kept. As this system has not been in a whole year as yet, no report of value can be made at this time.

Preventing Accidents

AN ounce of prevention is worth a pound of cure. This applies especially well to accidents. Quarries have many accidents that can be prevented, and it is the duty of the operator to provide the proper safeguards and have such rules and regulations as to reduce the chance of accidents to a minimum. It is not possible to list everything that should be done, but some things can be mentioned that may serve to call attention to other precautionary methods.

In making blasts every electrical cap and fuse should be treated with a testing machine before being used. A worthless fuse can thus be detected and not used. After each hole is loaded the charge should be tested in the same manner so as to know it will explode, and when a number of holes are connected together the circuit should be tested before exploding the charge. Misfires can thus be prevented.

If a misfire occurs, a metal bar should not be used to draw the charge. Metal is always a dangerous thing to use near explosives. This warning has been given blasters a thousand times, yet it is surprising how many still persist in using steel bars or wooden ones bound with steel. It is better to go slow in drawing a charge and be safe than to make speed and run the chance of an accident that will either cripple or kill several men.

Explosives are always dangerous to handle, not because of the explosives, for any well made and properly kept explosives are not dangerous if stored and handled with knowledge and care, but they become dangerous at once, when handled carelessly and used as they should not be. It is the duty of operators and their superintendents to see that all explosives are stored and handled properly and to lay down such rules and regulations as may be found necessary.

Nearly every pit and quarry uses some kind of transportation system and no man should be allowed to ride on cars or in buckets and skips. Only train men should be permitted on cars or motors. Too many men are injured by jumping on or off cars while in motion. It is much better for a man to use five or ten minutes walking than to try to save this time by riding and getting injured. The writer's practice has been to put up signboards telling employees that they are not permitted to ride upon cars. The rule must be enforced rigidly, even when horses pull cars. It may seem a hardship to make men walk, but it is better to do this than to kill one man.

There is seldom a reason why a man should ride in a bucket or skip. It is true that in very deep pits this may be the easiest way of getting men in andout, but it is much better to provide an incline or steps for men to walk than to run the danger of injuring men.

Ladders should never be used around a pit or ledge or plant if it is possible to provide steps. The latter are much safer than ladders but, if ladders must be used, they should be permanently fastened in place. If a round or step is broken it should be replaced at once.

Where steps are used, there should be a guard railing built on each side, so that men cannot fall. Tools and other articles should never be left upon stairways to trip up people.

Engines and other moving machinery should always be guarded by railing or screens or boxes. These railings need not be fancy, but built substantially. Men should never be allowed to step over or between belts, as it is a very dangerous practice and many men have been thrown into the machinery by it and killed.

All gears should be protected or

properly housed, and provisions must be made for lubricating them. Men's clothing is easily caught in gear wheels and they are thus dragged into the machines and injured. A wire screen or a box placed over gears will prevent this.

Motors and dynamos should have guard rails around them as there is always a decided chance of accident when men come close to rapidly moving machines.

Platforms must be used around many elevated machines, such as crushers, screens and washers. Such platforms should have guard railings built around them to prevent men from falling and at the base of the rail and just over the top of the platform a wide plank should be nailed. This prevents tools that may be laid upon the platform from being knocked down and falling upon men below and injuring them.

Planks for men to walk upon should never be laid down over bins and at other elevated places without being nailed securely; otherwise they can slip from place and men using them can fall. Whenever possible guard rails should be built along such planks or walkways, as it is by such measures that accidents are prevented.

When stones are handled in skips by derricks or cableways care must always be exercised that no stones are left in the skips as when they are there is always grave danger that such stones will fall out of the partly emptied skips and kill men. This has occurred in a number of quarries.

These precautions not only pay through decreasing the number of accidents, but also mean that the plant's liability insurance is likely to cost less. This may mean considerable saving in a year.

The Nelson Lime and Cement Co., Delaware, has filed a copy of its charter at Nashville, Tenn., showing a capital of $15,000.

Performance Tells the Tale

This title is an old and trite saying, yet many business men lose the significance of it by not taking the time to study subjects to which this saying is applicable. In the use of machinery, especially in pit quarries, performance counts for much and the title of this article should be considered in every operation.

There are on the market a very large number of machines that mean the saving of much money and increased production in many plants, which operators should have adopted many years ago, yet it is difficult to sell many of these machines, in spite of the fact that their performance tells the tale of economy and increased production. It is not good business to buy everything that a salesman offers: nevertheless the operator should listen to each story and investigate any device that promises to be a help to him. It would be manifestly a ruinous policy for any one to purchase every machine offered him, for many will not measure up to the claims made for them, and an operator might soon have a fine collection of junk on his hands. This is where performance tells the tale.

Some years ago a contractor started a big job on Long Island and was immediately importuned by a large number of manufacturers to try out their equipment and machines. This he decided to do if they were willing to send the machines for trial. More than twenty manufacturers took advantage of this opportunity, but not more than half a dozen of the machines tried were found suitable for the work. These he purchased and the rest he rejected, and some manufacturers never took the trouble to remove their property from the job.

Performance is certainly the test of the efficiency and adaptability of a machine and if any machine has not been tried out by a large number of users, the manufacturers should be willing to accept a conditional order subject to trial and rejection if the machine is not suited to the work. The fact is that some very successful machines are sold entirely in this way as the manufacturer knows he can make a sale much quicker by installing a machine and demonstrating the decided saving that can be made in operation over other machines. A long life to a machine and low op-

erating cost mean low production cost. The man who selects his machinery upon the basis of production and cost rather than price is purchasing upon the basis of true cost. Here again performance tells the tale.

In most cases well tried out machinery of merit must be purchased outright without conditions. Such a machine may be needed or found useful in reducing cost and the operator should have it, but he cannot afford to run chances of wasting part of his capital. What to do under such circumstances is at times a difficult problem.

In the April issue of Pit and Quarry the leading editorial told of the value to operators of visiting other plants. We believe that this editorial is worth the time given to reading it. This is the solution: Go to such plants as have recommended the machines and learn of their performance. A hasty inspection is not likely to be sufficient. One must give time for such an investigation and must thoroughly look into the uses and adaptability of the machine and must if possible see or obtain records of costs so as to know not only the machine and how it works, but also learn of its performance, for this is what tells the tale. It may be necessary even to visit more than one plant for at times an operator may be using a machine and getting indifferent results due to the fact that he has little knowledge of operation, while another man may be making big money by using the same machine in an intelligent manner.

The writer has had many experiences of this kind and knows whereof he writes. He remembers one case of where he recommended the purchase of a machine, but the man would allow no one to instruct him in its use, and lacking certain knowledge the machine added only to his cost. The writer recommended the same machine to another man who had been previously told by the first man that the machine was of no account. Upon the advice of the writer, the second man purchased the machine from the first man at a low price, and with proper instructions he reduced his operating cost 80 per cent with this machine. Any one asking the first man alone as to this particular machine would never have purchased one, but going to another man he would learn of its real performance, which told the tale.

Thus there are two ways of learning of the performance of machines and this is also true of improved methods of doing work. It will pay any one to consider these facts, for the fight in any line of business should be to keep down production costs and increase production volume. Every one is in the business of making profits. A manufacturer can only make his profits by helping a customer to make profits, but the manufacturer can not make a profit for a customer, if the latter is not willing to investigate the machinery offered him. To repeat again the theme of this article: It is the performance of the machine that tells the tale.

Captain Thew Ill

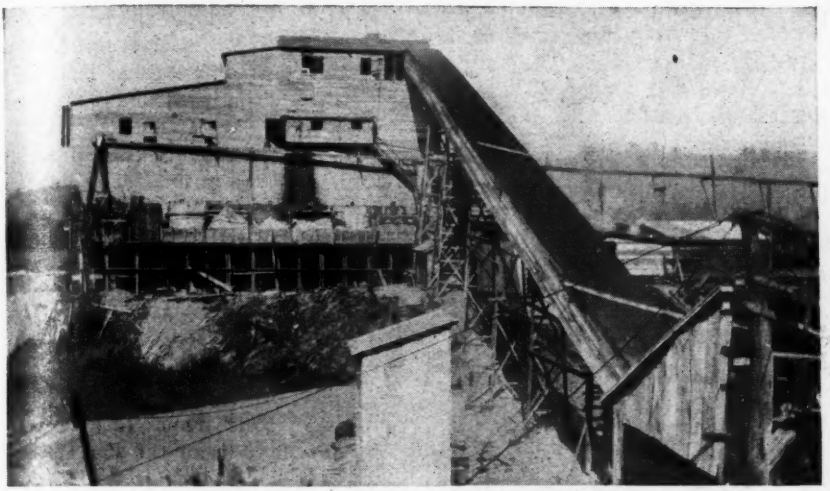
Capt. Richard Thew, inventor of the Thew automatic shovel, is in a grave condition at Fresno, Cal. Mr. Thew is in a hospital at Fresno suffering from an attack of pneumonia. He left Lorain last week for California and was stricken ill upon his arrival there.

Mr. Thew, a personal friend of Rex Beach, the author, is said to have been the inspiration for Mr. Beach's novel, "The Spoilers," and scenes portrayed in the novel are woven around a gold mine owned by Mr. Thew in Alaska, 600 miles from the North Pole.

The Beverly Stone & Sand Company, Knoxville, has increased its capital from $25,000 to $50,000.

The Mount Diablo Lime Marl Company, recently incorporated and one of the newest industries of Walnut Creek, Cal., has begun operation and manufacture of 100 tons of lime and marl a day. Richard L. Frye, president, stated that the capacity of the plant will be doubled in three months' time with two lime kilns, purchased for $42,000.

Preliminary work in connection with the construction of the $2,000,000 cement plant of the Pacific-Portland Cement Company at Redwood, Calif., was started recently. Work is being rushed, and it is expected that plant will be completed within 7 months. A 4,000-barrel per day output is planned, which will make the plant the second largest on the San Francisco peninsula.

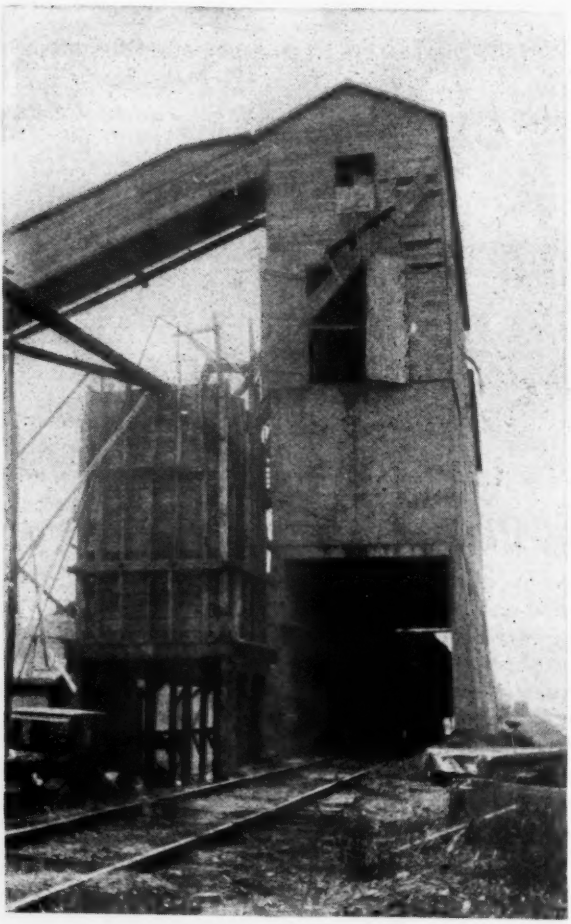


Puts Losing Plant on Paying Basis

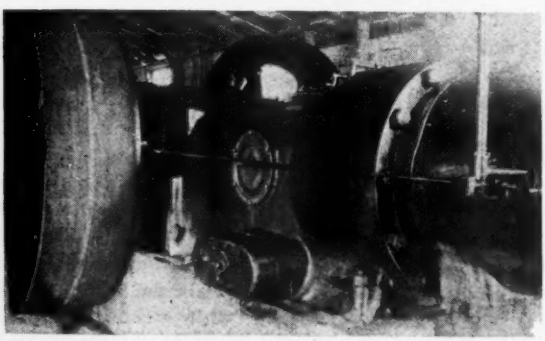
IN the southern section of Ohio there are many sand and gravel operations that are being very successfully conducted and are paying good profits on the investments. Not all operators of this section, however, are so fortunate, and occasionlly there is encountered an operation that has not fared well. Such a one as this was that recently taken over and put on a paying basis by S. E. Willey of Cincinnati. Although not nearly as large as some operations in the southern section of Ohio, this sand and gravel pit, located 15 miles out of Cincinnati in the Big Miami valley, is said to be yielding a profit on the investment at the highest rate known in the territory.

The plant has a daily production of approximately 1,000 tons. This material is secured from a pit 90 feet deep. Water is struck at 60 feet, although diggings are not old enough to meet with any extended water spots. The operation covers 10½ acres of ground and it is estimated that 2,000,000 or 3,000,000 tons of material may yet be excavated. The grades of material are said to be of the finest and the most durable quality in the Ohio valley. The output of the pit is well diversified and permits production of a large variety of materials. Excavating materials run 40 per cent sand, 48 per cent gravel and 12 per cent boulders that require crushing. The Willey plant has commercial sale for nine different grades of material.

When Mr. Willey took over the plant at a comparatively recent date, he did so with the intention of changing the operating method. He believed that, in this particular instance, a steam shovel, which works better than any other part of equipment in certain other instances, would be quite as satisfactory here as a power scraper. Accordingly he installed a rapid moving dragline excavator, a 1½ ton device manufactured by L. P. Green of Chicago. This scraper is run from a Flory hoist driven by a 45 horsepower Triumph motor connected through a silent chain drive. Material from the scraper is sent into a hopper which passes it on to a Webster screen with 3 inch perforations, tailings from



View of plant from side, showing car loading arrangement.



The Primm oil engine which furnishes power for dynamo that runs plant.

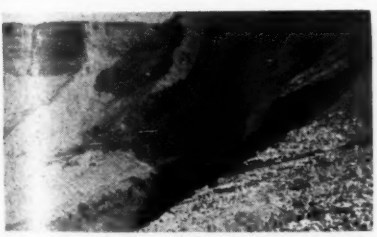
which go to an 18 by 25 Sturtevant crusher. The crushed material is passed to a belt conveyor with the gravel and is elevated 90 feet into the final screening and crushing building. Here a 48 inch by 16 foot Webster screen with two jackets takes up the work. The graded sizes from this screen go direct to bins, the rejections to a 24 inch Symons disc crusher. From the disc crusher the material is again elevated to a dry screen which makes three grades of the crushed material, 1¼ inch, ⅝ inch and dust. The finished products are contained in 8 concrete bins which have the capacity of two cars each. Within the next six months provision will be made to build additional concrete bins ofr direct hauling. Under the present arrangement material is shipped only into railroad cars on the Chesapeake and Ohio Railroad, whose southern division tracks run by the plant.

Water used in the washing of gravel and for other purposes throughout the plant is supplied by a well upon the premises. It is pumped to the plant at the rate of 420 gallons per minute.

The plant is electrically operated from current produced by a Western

Electric 120 kilowatt generator turned over by a Primm Oil engine. The generator produces direct current at 250 volts, 545 amperes, at a speed of 460 R. P. M. The Primm oil engine, a production of the Power Manufacturing Company of Marion, Ohio, is an FU type of 150 horsepower with a 21 inch bore, making 200 revolutions per minute. The engine has been averaging a 100 gallon consumption in a 10 hour working day, or 10 gallons per hour. As the cost of the oil is but 5¼c per gallon, the daily cost for power fuel is only $5.25. The fuel cost of the steam equipment formerly used in the plant went as high as $18 or $20 per day. This engine is connected to the generator by a 78 foot driving belt.

The Primm oil engine is started under air compression supplied by a 3 horsepower Novo engine. One hundred pounds of air are sufficient to turn the engine over. Mr. Willey has studied the subject of power quite thoroughly. He has found that a gas engine would stall every 75 seconds when the excavator stopped moving, reducing the current from 150 to 75 horsepower. Operation of the

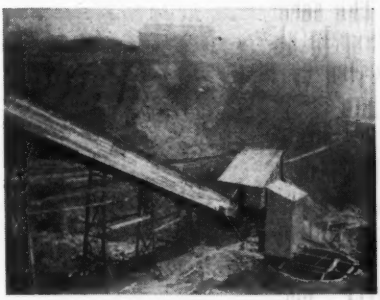


The Power Scraper at Work.

oil engine has been found very satisfactory.

The changes that Mr. Willey has made in the plant design have resulted in cutting the overhead deeply, increasing production from 45 to 100 tons per hour and greatly reducing the troubles that come with trying to maintain a large working force. At the present time, the entire plant is run by five men and a superintendent.

The Willey plant is a clear demonstration of the fact that knowledge of the sand and gravel industry in its finer details is the key to success. From a losing venture of a couple of years ago Mr. Willey, who is the second oldest man in the business in the southern Ohio district, has built up a well paying business.



Looking Down Along Main Plant Conveyor.

Consider Convict Labor Cement Plant

Establishment of a state cement plant somewhere in Arizona for the purpose of lessening highway construction costs and to provide employment for the 400 state prisoners at Florence will come up for consideration by the legislature in event of a special session in January, the Arizona Gazette says.

Plans for a state owned and state operated plant have been under consideration for some time, the Gazette states.

In fourteen states grading will probably be impractical after the middle of November, and in some of them at an earlier date. Gravel surfacing can be placed in most of the states on from 120 to 200 working days, although 10 of them report a greater number. In 26 states concrete surfacing can be placed on from 100 to 150 days, and in 16 states on from 150 to 200 days. In 28 states the season is generally over by November 1.

Baffles For Washing and Conveying Sand

A reader asks to be informed as to baffles in a trough or chute for washing and handling sand and small gravel.

The first question is what kind of baffles must be used to hold sand and gravel in a chute or trough and allow clay and other undesirable materials to be washed away.

The second is wherein must baffles differ to allow sand and gravel to be carried by water through a trough or chute.

In either case the grade of the trough or chute and the pressure of the water have some bearing upon the subject.

Thus a steep grade will naturally carry material much faster and easier than a flat gradient, and a stream of water with considerable pressure will move material easier than one of low pressure.

Thus a triangle or chute meant for washing should be given less pitch or incline than one meant for conveying and likewise it can be operated with less pressure of water, but it must be remembered that a trough meant for washing must have sufficient grade so as to clean the material out of it after it is washed and the baffles are removed, therefore such a trough should not be made too flat.

Assuming the gradients for each are correct, the rest depends upon the design of the baffles. A baffle to retard the movement of the sand and gravel and allow the material to be washed must go clear across the trough or chute and should be a few inches less in height than the sides of the trough. This is shown in figures 1 and 2.

By this the water flows over the tops of the baffles letting the sand and gravel be deposited against the baffles and the mud and dirt are washed away with the flow of water.

The baffles can be placed at two angles, one vertical and one at 45 degrees as shown in Figure 1. The amount of water should be gauged just to go over the top of the baffles, as this prevents sand from being washed away with the water.

The preference should be for the baffles on an angle of 45 degrees, especially if the baffles are to have holes bored in them. At this angle the water washes over a greater area of sand or gravel and thus makes it cleaner.

With holes in the baffles there are two movements of the materials, one caused by the water flowing over the top of the baffles and one by the water and material going through the holes. This means cleaner material and also causes the trough to first fill up at the lower end farther from the point of entry, instead of filling up first at the beginning of the trough. This also allows the water to wash the material better. The last one or two baffles in the trough should be without holes, so as to hold all the material upon them.

In order to clean the trough of the washed materials the baffles must all be arranged so as to be pulled out and with an extra volume of clear water the material is washed out into bins or stock piles.

It can be seen that the principle of these baffles is to allow some flow of water and material, yet to retard and agitate it and finally deposit it in the trough.

The principle of baffles in a conveying trough or chute is to keep the material so agitated as to cause it to flow continually with the water. This can be done by means of low riffles in the bottom, but the current of water would have to be swift. The easiest kind of a baffle for this purpose is one of cross baffles set at an angle as shown in Figure 3.

These baffles cause the water to

eddy as it flows, the baffles being at the same height as the sides of the trough. This keeps the various compartments clean as the water flows. When sand can be conveyed in this manner it is not done rapidly, depending upon the velocity of the water, but much cheaper than by any other method, the only operating cost being that of running the pump to furnish the water.

Preventing Non-Production Periods

IF there is only one crusher in a quarry or one machine in a sand and gravel pit, and an accident happens to it, the entire plant must be shut down; but when plants consist of several crushing or washing and screening units, then the machines, whenever possible, should be laid out so that a single machine can be cut out and the plant continue operation, even if the production is cut down, for in a case of this kind the old saying holds true—that half a loaf is better than none.

Few if any plants are so designed as to admit of by-passing material around a machine. The writer within a few days of writing this was talking to an engineer of no mean ability about crusher plants and those that produce sand and gravel, and the engineer stated that few plants of these kinds were designed and laid out except for immediate needs, paying but little attention to the future; and further that he had never seen such a plant designed to be operated as though an accident would ever occur, while in such plants accidents of more or less serious character were of daily occurrence. This engineer was correct in his statement.

His remarks and the experience of the writer in making frequent trips to many plants throughout the country agree, and money is continually lost by plants having to shut down while repairs are being made. In some cases this cannot be prevented, but in a large number of cases plants can be arranged so that a single machine can be cut out and the rest of the plant continue in operation so that men are not idle but a fair production maintained.

Recently in one quarry one of the secondary crushers was thrown out of commission for some hours and there was no production until the crusher was repaired. A single auxiliary chute that could have been put in place in fifteen minutes would have allowed the stone to have been by-passed around this crusher and onto a secondary crusher so that production need not have ceased.

In a sand and gravel proposition a small crusher that reduces the large sizes of gravel broke down, and as the screens discharged into a chute that fed the crusher, the screens and washing plant had to be closed down until the crusher was repaired. If the crusher had been located so that a small storage feeding bin could have been built between the screens and the crusher the plant could have been operated for several hours until the repairs were made.

These are two examples of how non-productive periods could have been prevented. Others could be given.

Every operator should study his plant so as to see how he can remedy such defects in his design and layout. Many a dollar could be made in a season if such periods of non-production could be eliminated.

The Clinchfield Portland Cement Corporation, of Kingsport, Tenn., will erect a plant for the manufacture of cement and other lime products at Perry, Ga., where they purchased land options and machinery held by W. F. Culbert. The new plant will cost approximately $3,000,000, and will have a capacity of 4,000 barrels a day.

Cement Demand High

Full Attention Bent on Securing Continuous Operation

(By Our Staff Correspondent)

Current records indicate that the prevailing demand for cement is exceeding production, and the mills in the Lehigh Valley district of Pennsylvania are working at peak outputs in response to the call. This is one of the busiest fall seasons ever experienced at the local plants and concerted attention is bent upon one goal —continuous operation. When the time comes for necessary machinery repairs and accordant brief curtailment, it is bound to work a decided hardship under the present status of affairs.

Practically every mill in this section is now running on a capacity basis, and shipping material as fast as ready. Mention has been made in these columns in previous issues of PIT AND QUARRY of the difficulty in creating reserve stocks, and the same condition now prevails with even more intensity. With very little material in storage, but very little more is finding its way to this quarter, and it is a matter of concern with some of the companies as to how this situation can be overcome to provide adequately for the coming months.

The mills view present conditions in a very favorable light and the outlook is highly encouraging. Never in recent months has the situation been better for maximum operations. There is an abundance of fuel at hand and every mill is well stocked up for a number of weeks to come; there is a fair supply of labor, and most all plants have their desired quotas; moreover, the men are showing a greater willingness to work, apparently, with more settled attitude regarding wages; there is a good supply of freight cars and not many embargoes; motor trucks are proving their value and efficiency under heavy service.

It is expected that the majority of the plants will continue operations right through the winter and very likely at full capacity for the bulk of this time.

The Atlas Portland Cement Co., is operating under full capacity schedule at its large mills at Northampton, and expects to maintain the present production basis for an indefinite period. It is now quite evident that the company plants will remain in active service throughout the winter, incoming business being at a high point and showing no tendency to diminish. Annual repairs, however, will be necessary at the different mill units, enforcing a slight curtailment in the various departments at intervals as the months advance. The plant stock houses are not carrying any appreciable reserves at the present time, owing to necessary heavy shipments. A full working force is being employed.

The Coplay Cement Mfg. Co., Coplay, is one of the active companies in this section of the Lehigh Valley, and full operations are scheduled at the mill. The packing departmen continues on an overtime basis, as recently adopted, and heavy shipments are leaving the plant for eastern and other distributing points. A large tonnage has been hauled fror this district by motor trucks. Th final arguments in the complaint o the company against the Philadelphi & Reading Railroad Co., for alle excessive freight rates on limestone, were heard recently by the Publ Service Commission, and a decision is expected at an early date. The company maintains that the road places a too heavy tariff on the commodity noted from Myerstown, in Lebanon County, a point of supply, to the plants at Coplay and Saylor.

The Penn-Allen Cement Co., Allentown, continues under heavy capacity at its plant, and expects to maintain the current schedule for some time to come. The Alpha Portland Cement Co., likewise, is active at its Easton and Martin Creek mills, while the Lehigh Portland Cement Co., is running full at practically all of it different mills in this part of th state, including the New Castle, Ormrod and West Coplay plants. The Pennsylvania Cement Co., continues active at its mills in the Bath district, and large shipments are leaving the plant; one of the barns on the company's farm, near the city, was destroyed by fire early in October, and several animals were lost.

The Universal Portland Cement Co., Universal, Pa., is operating on a maximum production schedule at its local mills, giving employment to a

large working force. It is said that the company has heavy orders on hand for early deliveries and will maintain the present running basis indefinitely. A contract has recently been given to the Nicola Building Co., Pittsburgh, for the erection of twenty new dwellings in the vicinity of the mills, for operatives at the plant. The company continues to quote from $1.75 to $2.00 a barrel for cement at the mill, in carload lots, as against a prevailing rate of $2.10 in the Lehigh Valley district of the state. This difference, however, is not regarded as any particular indication of the market trend, the Universal company being a subsidiary of the United States Steel Corporation, and its output considered by the other plants in the line of a byproduct.

The Acme Cement Corporation, Catskill, N. Y., with mill at Acme, N. Y., has arranged for an increase in capital from $2,800,000 to $3,500,000, a portion of the proceeds to be used for general expansion in operations. The company is running on a full basis at its plant and large shipments have been leaving for New York and other markets.

The Kansas Portland Cement Co., Federal Reserve Bank Building, Kansas City, Mo., a subsidiary of the International Cement Corporation, New York, has commenced work on its proposed new mill unit at Bonner Springs, Kan., a general contract for which was awarded recently to the McDonald Engineering Co., 533 West Jackson Boulevard, Chicago. The new plant will comprise a number of buildings, with power house and miscellaneous mechanical structures, and is estimated to cost close to $1,000,000, including machinery. It is expected to have a portion of the plant ready for service during the coming year. Surveys and other similar work have been handled by the Tuttle, Ayers & Woodward Engineering Co., Chicago,

A new cement mill is projected in the vicinity of Anna, Ill., by a company now being organized by A. A. Fasig, of that place, and associates. It is said that the plant will be designed for an initial output of about 75,000, barrels per month, and is estimated to cost in excess of $650,000.

The recent fire at the A. Y. Reed Gravel Plant, Elgin, Ill., was kept well in hand by the fire department there.

Do Steam Shovels Pay?

During the past year a number of articles have appeared in PIT AND QUARRY descriptive of steam shovel loading of broken rock in crushed stone quarries. There have also appeared several articles discussing rock loading both by hand methods and steam shovels, for it is a fact tnat there is still a large number of operators who question the economical use of steam shovels in quarries. There are even some who have installed steam shovels only to take them out again and go back to hand loading. The writer knows of one contractor, operating extensive quarries, who for nearly a year had several steam shovels idle in his quarry yard, yet who would not employ them in the quarry claiming that he had so used them and found them uneconomical.

Such facts as these would seem to discredit the use of steam shovels for quarries, but the writer is convinced that, although there are rare exceptions when steam shovels are not adapted to or economical for use in some quarries, yet in most cases they are big money savers.

This is a subject which should be seriously considered by the many operators who are wasting money by obsolete hand methods. It is possible to do this only by having sufficient data to prove conclusively that *in most cases steam shovels will prove cheaper.*

The importance of this subject can be readily understood when the fact is made known that the greatest single item of cost in producing crushed stone is the loading and transporting of the rock fragments from the quarry ledge to the crusher. Not only is this true, but the output of the crusher must depend upon the regularity and rapidity with which the rock fragments are delivered into the crusher. Thus in considering the question two sets of costs must be studied in order to show actual savings or to compare the relative cost of hand and steam shovel loading. Two sets are seldom kept, however.

To illustrate, let it be supposed that a hundred men loading by hand could load in a day a thousand tons of stone, at the same cost for the actual loading and transporting per ton as a steam shovel. If this was the case and it was found that the steam shovel on some days would load three

hundred tons more than the usual amount. It can be seen that with the same payroll the cost per ton for loading and transporting would decrease the cost of crushing and in fact all other operations. This would still be true if only two or three hundred tons of stone were produced in a week. On the other hand if hand loading was being done and for a few days a week one or two men were sick or drunk, and although the unit cost of loading and transporting would remain the same yet the crusher cost per ton would be increased as would other unit cost in the quarry.

From this it should be seen tnat even if the cost of loading and transporting a ton of rock would be the same by the two methods or a little less by the hand method, yet this can mean nothing, unless the total tonnage produced daily or weekly is considered and the other unit cost figured out and compared.

In the April issue of PIT AND QUARRY Oliver Bowles had an article entitled, "Rock Loading at Lime Plant Quarries," wherein he discussed the use of shovels and loading methods in Lime Quarries and showed some limitations of steam shovels in lime quarries which do not apply to other crushed stone quarries. In this article Mr. Bowles propounded six questions to quarry men. If every quarryman would take a few hours time to answer these questions and send them to this journal it would prove not only helpful to themselves but beneficial to many others. These questions are worth repeating and it is to be hoped that this journal will receive a large number of answers which can be put into shape for publication.

Mr. Bowles questions to operators were:

1. Do you prefer hand loading in your quarry and why?

2. Do you prefer steam shovel loading in your quarry and why?

3. What are your hand loading costs per ton?

4. What are your steam shovel loading costs per ton?

5. What items are included in steam shovel costs?

6. What information on loading could you supply in addition to that presented in this paper?

In addition to these the writer would like to ask a few more questions that bear on this subject as outlined in this article:

1. What tonnage do you load by hand per day?

2. How does this fluctuate from day to day according to the size of the crew?

3. How does this tonnage compare with that of your crusher plant?

4. What tonnage do you load by steam shovels per day?

5. How does this fluctuate from day to day?

6. How does this tonnage compare with that of your crusher plant?

7. What variation is shown in your total cost or your crusher cost by the fluctuation of tonnage loaded and transported?

With information of this kind tabulated and published, conclusive data could be presented to operators to show that steam shovels do pay in both large and small quarries.

Chico Crushed Stone Company, Wichita Falls, Texas has been incorporated for $100,000. Incorporators: G. D. Anderson, J. A. Kemp and A. W. King.

The Muskingum Sand and Gravel Company, Zanesville, Ohio; capital $10,000. Incorporators: Carl O. Bolin, Ralph D. Karns, Laura A. Karns and Blanche M. Bolin.

The Pacific-Portland Cement Company is making rapid progress in the construction of a large million dollar mill near Gerlach on the Western Pacific railroad north of Reno for the manufacture of plaster and other products from a huge deposit of gypsum.

The City Council, Los Angeles, adapted a resolution approving the changes in the specifications for rock used in construction of streets, curbs, sidewalks and gutters in Los Angeles. The change of specifications will allow more competition for supplying this material.

The Lowell Sand Company, Grand Rapids, Mich., has filed a petition for dissolution of the concern. The Grand Rapids Trust Co. was appointed temporary receiver. An unexpected encounter with heavy clay on the company's 331 acres has seriously affected its business.

Wrenches and Their Uses

Machinery cannot be operated and steam and water pipes maintained without a liberal supply of wrenches. There are many kinds of wrenches and naturally they vary in size.

Anyone having to have these wrenches should know their names and uses, and this applies to every pit and quarry owner. It is with this idea in view that the various kinds of wrenches will be described in this article.

The most common wrench in use is known as a monkey wrench. It is meant for use on nuts and bolts. either square, hexagonal or octagonal nuts. It has two square jaws, smooth on the inside, and the size varies with the length of the tool, such as a 10-inch wrench, a 12-inch, and so on. The stoutness of the tool, together

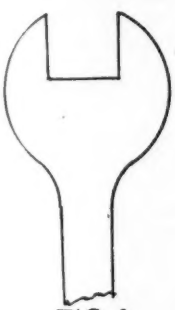


FIG. 1.

FIG 2

with the size of nut it will take, varies with the length, it being adjustable to the size of the nut.

If nuts are very large, there being a limit to the size of a monkey wrench, a solid or S wrench is used. These can be purchased, and many are included with machines bought, but it is also possible to make them in a shop. These wrenches are also used for small nuts, as one feature of the solid wrench is that it is always ready for use for a particular size of nut, and does not have to be adjusted as does a monkey wrench. Most solid wrenches are meant for one nut only, except that an S wrench generally has an opening on each end, each for a different size nut.

The jaws of these wrenches are square and smooth on the inside, as shown in the sketch in Fig. 1.

Thus like a monkey wrench they cannot be used on anything round as a rod, bolt or pipe. For these round articles the jaws of the wrench must be cut into sharp ridges so that they will bite into the metal. The wrench used for most of this kind of work is a Stilson wrench. Unlike the monkey wrench it does not have a handle protected with wood, but a flat metal handle like the solid wrenches. Its jaws, however, work on the same general principle as the monkey wrench. A Stilson wrench can be used for either round articles or for nuts, so it can replace a monkey wrench. For that reason it is coming into more common use than the monkey wrench, the only thing against the Stilson being that it costs a little more than does a monkey wrench.

Like the monkey wrench it runs in sizes based upon the length of the tool.

When large diameter pipe must be handled, beyond the sizes that the wrenches are made to take, pipe tongs or wrenches are used. These pipe tongs are also used in connection with Stilson wrenches on small diameter pipes, the tongs being used to hold the pipe and, the wrench to screw it. These pipe tongs have a piece of chain on them that goes around the rod or pipe and fastens onto the head of the tongs. It is the head and the chain that hold the pipe. A small bench pipe vise is now made on the same principle to hold pipe while it is being cut and threaded.

There is also a combination wrench. There are several variations of this wrench, but they are all a double headed wrench. One side of the head is like a monkey wrench, while the other side has a claw-shaped jaw that bites into the metal, while the other jaw is roughened, so that the jaws will bite into a round surface. This wrench is not as strong or as satisfactory as a Stilson, yet it can be used on either a pipe or bolt and on a nut. But the same thing is true of a Stilson.

An alligator wrench is a tool that is being used more than formerly. It was formerly a solid wrench but of late years has been made adjustable. The shape of this wrench is shown in Fig. 3. It can be seen from its roughened jaws that it will take hold of pipe as well as nuts. The shape of the jaws shows that it will take different sizes of nuts without adjusting

and the rough jaws hold anything it takes. The wrenches are generally made of small sizes and are used in confined and cramped places for small pipes and nuts.

There are a large number of solid wrenches that bear special names, as a track wrench, a wagon wrench, etc. These are made for a given size nut, and the other end or handle is given

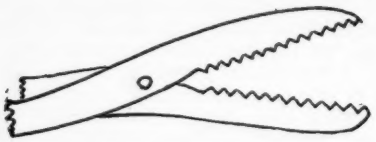


FIG. 3

some special shape, as with a track wrench which is pointed to run through the plates and the rail to line up the various parts so that the bolt can be driven through the holes.

A tire wrench is used to loosen the nuts and bolts on a demountable rim on an automobile. This is shaped like a brace and has a socket head on one end of the brace. It is used exactly like a brace and bit. This is one type of a socket or follow head wrench.

Follow head wrenches must be used in many places, especially the interior of machinery, when a wrench with a handle cannot be used. The loosening of nuts when they are exposed can be done with such a wrench and the type like a tire wrench can be used; but when the nut is far down in a cylinder or other ordinarily hidden place the socket wrench must only have a long end on it. This is made square so that a monkey wrench or a Stilson can be used on it. Thus two wrenches are used to loosen up such a nut or bolt.

These are the principal wrenches used in pit and quarry operations.

An appropriation of $125,000 in the 1924 budget for the purchase and equipment of a municipal gravel pit or rock quarry was voted by the City Council, Minneapolis, Minn.

The L. J. Alexander Company of Napa, Cal., has dissolved and the copartnership has changed to a corporation, the Basalt Rock Company which was recently chartered.

Recent Patents

The following patents of interest to readers of Pit and Quarry recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

1,468,005. Screening-machine. Joseph A. Coyle and Charles H. Roth, Minneapolis, Minn.

1,468,630. Car construction. Frederick S. Gallagher, Yonkers, N. Y., assignor to Rodger Ballast Car Co., Chicago, Ill.

1,468,645. Car construction. John O. Neikirk, Lombard, Ill., assignor to Rodger Ballast Car Co., Chicago, Ill.

1,468,759. Apparatus for crushing or reducing minerals, ores, and other materials. Harry A. Stockman, Johannesburg, Transvaal, South Africa.

1,468,914. Chain-cutter for mining-machines. Edmund C. Morgan, New York, N. Y.

1,469,046. Loading-machine. Patrick J. McDonald, New Cumberland, Pa.

1,469,808. Dipper-tooth. Edward L. Pemberton, New York, N. Y., assignor to Frog Switch & Mfg. Co., Carlisle, Pa.

1,469,886. Sand-mixing device. Charles W. Bryson, Cleveland, Ohio.

1,470,520. Mining-machine. George R. Bennett. Pittsburgh, Pa.

1,470,532. Steam-shovel attachment. Thomas S. Husher, Boston, Mass.

1,470,570 to 1,470,573, inclusive. Mining-machines. Morris P. Holmes, Claremont, N. H., assignor to Sullivan Machinery Co., same place.

Earnings of the United States Gypsum Co. show an increase over corresponding eight months of 1922. It is the opinion of the officials that business will continue at present rate inasmuch as building construction shows no let up.

The Kaiser Gravel Company, Livermore, Cal., is working a day and night crew to finish their plant located on the southwestern outskirts of Livermore. The company has large contracts for furnishing material for road work.

Eastern Business Good

Unusually Dry Season Permitting Full Production

(By Our Eastern Correspondent)

With the continuance of fine, seasonal weather, both from the standpoint of production and construction, now prevailing for a number of weeks past, there is little cause for any immediate complaint on the part of those in the sand, gravel and crushed stone industry in the eastern districts. The unusually dry season has permitted full production, practically without intermission from day to day at sand and gravel properties as well as at stone quarries, and producers for the most part have been making the most of the opportunity. At the majority of the plants, close to normal outputs have prevailed, with satisfactory distribution.

The market at New York and vicinity continues to hold decidedly favorable aspects, and with construction on the advance, as evidenced during the past fortnight, there is bound to be a corresponding increase in material consumption, particularly in the line of cement, sand and gravel, and other basic commodities. A feature of the situation at the present time is the continued activity in the line of road constructon and repair, and state and county work is going forward apace. The industries that enter into this branch of engineering, with cement, crushed stone and gravel not the least among them, are feeling the effects of this movement and very favorable business has been recorded.

Excepting marble cutters and setters, and one or two minor branches of construction, satisfactory conditions prevail in the field of labor. The men, for the most part, are showing a tendency to abide fully by present wage scales and this attitude is assisting materially in encouraging greater activity. The marble workers are out on strike with a demand for an advance in schedule from $10 to $11 a day, despite the fact that they agreed to the lower level early in the spring. The employers are not inclined up to the present time to grant the increase.

There is continued stability in the local material markets, and the past month shows little if any change in price levels for sand, gravel, crushed stone, cement and affiliated products. Dealers are helping the current buying movement with sizable orders and are active in turning materials for immediate consumption. Well informed interests in the industry hold to the opinion that the present situation will prevail until the first of the year, with probably a little slackening during the holidays, usually to be expected.

Crushed stone is priced at $1.65 a cubic yard for 1½-in. stock, in cargo lots, f.o.b. New York, with $1.75 asked for ¾-in. material. These are exactly the same figures as prevailed a year ago this time. Dealers are selling both sizes of broken stone at $3.25 a cubic yard, delivered to site. In the New England district, at Boston, the wholesale figure is $1.60 a ton, f.o.b. city, while local dealers are asking $2.50 a ton for delivered stocks, truckload lots.

The best washed gravel maintains at $1.75 a cubic yard in carload lots at New York, both 1½ and ¾-in. sizes. Dealers price the commodity at $3.50, delivered in Manhattan and Bronx Boroughs. There is fair distribution at the present time and good calls for early deliveries. At Boston, the wholesale market stands at $1.40 a ton for desirable gravel, with supply yards quoting around $2.25 and $2.30 for retail stock.

Good building sand at New York holds at $1.25 a cubic yard, wholesale, in cargo lots, as compared with a rate of $1.00 a year ago this time. In the retail market, a quotation of $2.50 a cubic yard, delivered, is being made, and current operations are absorbing a good supply of the material at this rate. In the New England section, Boston has a current wholesale level of $1.10 a ton, with dealers in this city asking $1.75 a ton, delivered, for what is commonly known as mortar sand. Beach sand, both at New York and Boston, is retailing at $5.00 a cubic yard.

Portland cement shows no advance in level, despite the active call for material and the rapid approach of the winter season. At New York, alongside dock, quantities are being turned at a $2.30 flat rate, per barrel, in carload lots, without bags; delivered by trucks, the figure varies from $2.70 to $2.75. In the retail market, a rate of $3.20 a barrel is quoted, less the standard bag rebate of 10

cents each. Incoming supplies from the New York and Lehigh Valley districts are sufficient for all immediate call.

Jesse B. Miller, Durham, Conn., has leased the quarry of the Laurel Brick & Sand Co., in the Moramas district, near Middletown, Conn., for a period of 20 years, and plans for extensive operations at the property, providing necessary equipment for this purpose.

Following a period of good business, New England stone quarries are experiencing a little lag at the present time, and the call is noticeably diminished. It is expected that curtailment will be placed in force at a number of the plants in view of the fact that current production is apparently larger than the immediate market can absorb.

A new company has been formed at Buffalo, N. Y., under the name of the Seneca Washed Gravel Corporation, capitalized at $50,000 in preferred stock and 4,500 shares of common stock, no par value. Plans are being arranged for early operations in this district. The new organization is is headed by A. F. Cartside, B. F. Milson and C. H. Fisher, and is represented by Edward Gram, a local attorney, with offices in the White Building.

The Bloomfield Clay Co., Metuchen, N. J., has leased the sand rights on its clay properties in this section, and a large production is expected; operations will be carried out over a large tract of land, with railway siding and waterway available for shipping. The Bloomfield company, headed by Charles A. Bloomfield, is also planning to dispose of a considerable acreage of its clay lands.

Robert A. Montgomery, Lambertville, N. J., prominent in the quarrying industry in this section, died, Oct. 7, at his home at 82 North Union Street. He was born in 1861, and became identified with the stone quarry business while associated with B. M. and J. F. Shanley, local operators. Later, he formed the Delaware River Quarry & Construction Co., acting as president of this organization, which has properties at Moore Station, north of Lambertville, and in other sections. He is survived by his widow, son, and a number of grandchildren.

The Avalon Sand & Gravel Co., Philadelphia, Pa., is now operating on the Philadelphia Road, near the city limits, and is distributing large quantities of sand and gravel. It is purposed to continue active production in accord with current demands. The main office of the company is situated at 505 West Redwood Street.

The DeFrain Sand Co., Philadelphia, Pa., has taken a large contract for material from the Philadelphia & Reading Railroad Co., and will furnish about 8,000 tons of sand for use in the construction of the new seashore line terminal at Camden, N. J. About 10,000 tons of pebbles will also be supplied by the same company for this operation.

The Reading Sand & Stone Co., Reading, Pa., has been continuing active production at its properties on Mount Penn, overlooking the city, with heavy distribution to neighboring sections. It appears, however, that curtailment will soon be enforced, due to a 60-day notice served on the company by the city early in October, ordering the discontinuance of operations and the vacating of the land. This action is due to a recent condemnation proceeding in the Supreme Court, the municipality desiring the land for its park and boulevard system, the court allowing a $45,000 award for the property. The company has entered an appeal from this award.

Employes of the Parsons Brothers Co., Pen Argyl, Pa., operating local slate quarries, held their annual clambake at Leonard's Grove, Northampton, Pa., on Oct. 6. The outing attracted a large gathering, and a number of interesting and pertinent addresses were made by men prominent in the company. A boxing bout was a feature of the afternoon sports.

The Romans Sand & Gravel Co., 514 East Thirty-ninth Street, Baltimore, Md., recently organized with a capital of $40,000, will operate properties in this section, and plans are said to be in progress for extensive development and production. The new company is headed by Alexander Romans and C. Lewis Engel.

A stockholder and creditor, John B. Gontrum, of the Canal Lime & Stone Co., Baltimore, Md., has made application to the Circuit Court of the appointment of a receiver for the company. It is set forth in the petition, that the company was previously engaged in the operation of stone quarries in Washington County, Md., and that this property has been sold under foreclosure proceedings.

Cincinnati Doing Well

Favorable Weather Affords Good Production Opportunity

(By Our Cincinnati Correspondent)

Continued favorable weather of moderate temperature the past thirty days has afforded good opportunity for sand and gravel plants to increase their output considerably over the same period during past years. Production continues unabated, and, as a consequence, an ample supply of all grades of materials is at hand. The outlook as a whole is favorable, and a stable demand is fast becoming the general condition of the southern Ohio district. Building statistics, although they show a slight decline, bear out the fact that construction in Ohio is holding up well. Current building especially is of interest and profit to basic material dealers and producers, as contractors are using large supplies of all materials in hastening the completion of foundations before the advent of freezing weather restrains further operations.

Although an ample reserve in materials is being built up under the encouraging weather condition for pit operators, the same optimistic working field has not prevailed of late for river diggings. With no rain the past thirty days, a condition has been brought about on the Ohio River, which is rather detrimental to immediate business. The river stage at the Cincinnati district was as low as 7 feet one day in October. This was caused not only by the lack of rainfall, but also because government dam officials were preparing a "wave" to float shipments from the Pittsburgh district. The T. J. Hall Company, the largest river sand and gravel company of Cincinnati, announced this month that the low stage practically prevented entirely their reaching any gravel bar deposits, and very little of the sand bar material was available.

Inquiries and other activity evidence, however, a good winter business, and even in the face of later subsiding building and road construction there is no indication of price lowerings. In fact, winter will have little effect on a decreased demand for road building materials, as the call emanating from the latter source has been but small in the southern Ohio district for many months, because financial resources of Cincinnati and contiguous territory for road building have been reduced to a minimum. There has been no revision of prices on any one material. Washed gravel continues at the past quotation of $1.50 per ton, f. o. b. cars, sand at $1.20 f. o. b. cars, with cement in better demand at $2.99 a barrel, and lime quoted at the customary figure of $16.80 per ton.

Raymond Smith, Republican, has been appointed by Highway Director Louis A. Boulay to take charge of gravel road construction in Ohio. Governor A. V. Donahey, a Democrat, has consented to the appointment. Director Boulay has shown his sincerity in his work by appointing Smith, instead of a Democrat for political reasons. Smith's knowledge of road building and achievements in that respect, it is said, are without a parallel in the state.

Reports from a number of gravel pits in the Ohio and Miami Valleys are most optimistic in tone. The weather conducive to top production has paved the way for better business in the sale as well as output of material. S. E. Willey, a pit operator in the Big Miami Valley, reports his production for October the largest in a number of years. Difficulty in getting railroad cars is past, according to Mr. Willey, and prices are satisfactory in every respect.

J. E. McCracken, of the J. E. McCracken Supply Company has experienced a heavy demand and is looking forward to a busy Fall. The only scarcity existing, according to Mr. McCracken, lies in the failure of certain cement mills to fill their orders in time. It has been said that these out-of-town mills take from two to three weeks in many instances to ship cement of late weeks.

P. C. Hodges of Columbus, and Harry Donnelly of the Ohio Gravel Ballast Company, Cincinnati, have been made chairman and vice-chairman respectively of the Crushed Stone, Sand and Gravel Committee of the Regional Advisory Board of the railroads representing the states of Ohio, West Virginia, Indiana, and Kentucky, which was organized at Cincinnati on October 11th.

Ask Demurrage Changes

Railway Association Committee to Hear Request

(By Our Washington Correspondent)

The request of the National Sand and Gravel Association for a modification of the car demurrage rules will be heard by the general committee of the Transportation Division of the American Railway Association at its next meeting, which probably will be in December. While it is possible that the committee will grant the request of the association, nevertheless, if the request is not granted, steps are being taken to carry the matter to the Interstate Commerce Commission in a formal complaint.

In its request for a modification of the demurrage rules, the National Association simply asks for an equalization. It seeks no favors, as explained by Secretary Barrows, but wishes to be put on an equal footing with the coal industry. For example, the coal industry can store coal in cars and let it stand indefinitely on a siding without paying demurrage charges and while the sand and gravel industry would desire such a privilege, of course, if the coal industry still retains it, it at least thinks that the situation should be equalized and that both or neither should have such a privilege.

In this connection it might be well to note that statistics filed in the Washington office of the association show that every production record of sand and gravel has been broken this year to date. The production year begins and ends January 1, so, of course, complete records for the year are not available at this time. This will be one of the arguments used for equalization of demurrage charges. Secretary Barrows is hopeful that the situation can be adjusted before the committee so that an appeal will not be necessary to the Interstate Commerce Commission. It is felt that the railroads should back the appeal for they lose the use of and revenue from cars while being used to store coal.

An unusual interest is already being manifested in the next annual convention of the association to be held at the Hotel Chase, St. Louis, on January 22-23. A two-day convention is an innovation for the association which, heretofore, has always taken three days for its annual meeting. There will be a meeting of the Board of Directors, at luncheon, on January 21. An interesting program of notable moving pictures will be a feature of the St. Louis meeting. It is already indicated that the attendance will be the largest in the history of the association.

The Bates experimental road, which was especially constructed for experiments by the State Highway Department of Illinois in co-operation with the Bureau of Public Roads, Department of Agriculture, will be further subjected to a number of tests under the destructive pounding of trucks, and it is expected that much valuable information will be gained for use in future road construction. In addition to specialists assigned to investigate soil conditions, temperature effects, and other factors, five engineers will constantly observe the effect as the trucks continue their daily grind. The experiments will continue until all the sections have been thoroughly tested. In former experiments some of the lighter sections failed under the traffic of light trucks driven along the edges of the surfaces on the first day of the test. The road is two miles long and consists of numerous sections of different types of construction. The day the road was opened for the tests, 12 trucks with bodies removed to make a load of 2,500 pounds on each rear wheel were started on the trips. The trucks were driven so that the outside wheels were on the edge of the paving, and almost immediately some of the sections began to fall. This was expected, as the sections were of light design and intended to demonstrate the futility of such construction.

The length of the working season is a most important element in road construction and one in which there is considerable variation, according to the bureau, which has collected data from all of the states. Deducting Sundays only there are 313 working days in the year and Alabama, Mississippi, and New Mexico report that grading is possible on 300 of them. Neighboring states report as follows: Florida, 265; Louisiana, 260; and Texas, 275. Contrasted with these are Maine with 110; New York, 150; Wisconsin, 153; and Western Oregon, 100.

Pittsburgh Fall Active

Producers Working at Big Winter Reserve Stocks

(By Our Pittsburgh Correspondent)

The fall season has been an active one in the sand and gravel industry at Pittsburgh, Pa., and operations are going forward on a basis that indicates continued production until well into severe weather, whenever this may come. There is a strong, healthy tone in the demand for stocks and a large tonnage is being taken from the rivers by the sand-diggers of the various operating companies. A number of new steel barges has been placed in service in recent weeks and these additions to the fleets come at an opportune time. Practically all of the producers are making the most of the present favorable situation, and reserve stocks are receiving attention for the months ahead.

Market levels hold to established figures without important change. The quotations are quite rigid and competition for the most part rests on the matter of delivery. Best quality washed sand is selling from $1.25 to $1.40 on the water front on a tonnage basis, with local supply yards pricing the stock at $2.40 and $2.50, delivered to the building site. The wholesale market is quite active, with local consuming industries taking a fair share of the production.

Washed gravel continues at $1.60 a cubic yard, f.o.b. barge, with a $2.00 level prevailing for material delivered on the waterfront. Building material dealers quote $2.50 and upwards for gravel taken to destination, according to the length of haul. As in the case of sand, wholesale interests are absorbing a good amount of current output, and there has not been much opportunity to stock up for future business.

Portland cement in the Pittsburgh market is selling wholesale at $2.24 a barrel, less bags, substantially the same figure which was prevailing a year ago at this time. Retail, the price holds at $3.50 per barrel, delivered, with customary 10-cent a bag rebate. Crushed stone, both 1½ and ¾-in. sizes, remains at a level of $2.85 a cubic yard for wholesale account, with $3.50 and above asked for desirable stocks in the retail market.

Operations on the rivers for the month of September, as compiled by the local Federal engineers, give an indication of the heavy business which is prevailing in the Pittsburgh district. On the Allegheny River, the haulage totaled 97,845 tons of gravel, and 108,595 tons of sand; on the Monongahela River, the aggregate for the month was 91,184 tons of gravel, and 117,272 tons of sand; while on the Ohio River, the output was 80,908 tons of gravel, and 98,730 tons of sand.

The Freeport Sand Co., is being organized by Pittsburgh interests, following the granting of a state charter on October 15, and extensive operations are projected in the vicinity of Freeport, Armstrong County. The company will operate diggers for sand and gravel production, and do a general business in this line. It is headed by A. L. and W. Earl Tseman, and William N. Ferguson. John J. Bane, an attorney with offices at 71 St. Nicholas Building, Pittsburgh, represents the new company.

The different producers in this section are keeping their sand-diggers in full service on the rivers with heavy daily incoming tows for immediate distribution. The Rodgers Sand Co., has been hauling a large tonnage during the past month and enjoying its usual good business, while J. K. Davidson & Brothers have been equally active in the production of fine washed sand and gravel from the Allegheny River, making river, rail and motor truck shipments with regular dispatch. The Keystone Sand & Supply Co., is another active producer.

A number of sand and gravel companies from other districts are coming to Pittsburgh for their new barges, and among these are the Ohio River Sand & Gravel Co., Louisville, Ky., and the Standard Sand & Gravel Co., Wheeling, W. Va. The first noted has recently received two steel barges from the local plant of the Dravo Contracting Co., while the last mentioned concern has had one such new barge constructed at this same works.

The Iron City Sand & Gravel Co., has been organized to operate in the Pittsburgh district. Ralph D. McKee, 1012 Park Building, is treasurer.

Standard Stone Company, Inc. Capital $10,000. Directors, Nathan and Betty Ossip, 822 Saratoga Ave.; Abe Linder, 548 Bedford Ave., Brooklyn.

Pulverizing Dry Materials with Air Swept Tube Mills

An air swept tube mill has recently been brought out by the Kennedy-Van Saun Mfg. & Eng. Corporation of New York City, which, it is claimed, has greatly increased horsepower and capacity per horsepower.

The principle of the air swept mill is the sifting of superfluous material from the mass as it is finished, to the desired fineness. It obviates the former necessity of building the tube mill of an unusual length in order to produce a medium fine quality, which contained little impalpable powder and meant an expenditure of about 25 horsepower per ton per hour of material produced when grinding to particles, 75 per cent of which would pass a 200 mesh sieve. The air swept tube mill produces a ton of material for less than 11 horsepower per hour, and by adding first and second products together approximately 90 per cent will pass a 200 mesh sieve, the highest percentage of impalpable powder ever known.

The mill is driven by a 125 horsepower motor direct connected through a silent chain drive and clutch coupling and the 60 inch fan is driven by a 25 horsepower variable speed motor direct connected to the fan by flexible coupling. The input to the tube mill was determined at 120 horsepower and the input to the fan motor at 12 horsepower by the electric company furnishing the power, the total power for driving mill at fan being 132 horsepower.

The air swept tube mill is past the experimental stage, having been in operation for about two years, and tested in practically every kind of material. Its success has warranted the manufacturers in equipping all of their tube mills for fine grinding so that they may be converted into air swept tube mills if desired.

Those desiring full information can secure it by addressing the Kennedy-Van Saun Mfg. & Eng. Corp. at 50 Church St., New York City.

The plant of the Pratt Rock and Gravel Company, Folsom, Cal., will employ twenty to forty people, and Clarence F. Pratt, president, says the plant should be producing crushed rock by December 15.

Osgood 1¼ Yard Steam Shovel

Realizing the need for a full revolving steam shovel of greater strength and capacity, the Osgood Company has added to its line a new 1¼-yard heavy duty revolving steam shovel. The heavy tasks to which such a machine would be put have been constantly kept in mind and the shovel has the strength and power to perform successfully and to endure all work to which a machine of this type may reasonably be put.

The same high standards of quality and workmanship have been maintained in this as in all other shovels of Osgood manufacture. The new machine has incorporated in its construction the standard Osgood features of proven merit such as horizontal hoisting engines, submerged tube type vertical boilers, centering gudgeon for connecting main body casting to path gear, simplified continuous tread mounting, double geared shipper shaft, automatic trip rope tension, etc.

The machine can be equipped for high dumping or for digging trenches, and is especially adapted for dragline work or clamshell or for use as a crane. The drums furnished for dragline or clamshell are of sufficient power to operate the buckets with single lines, greatly speeding up the operation as well as reducing wear on the lines by eliminating a set of sheaves at the bucket connection.

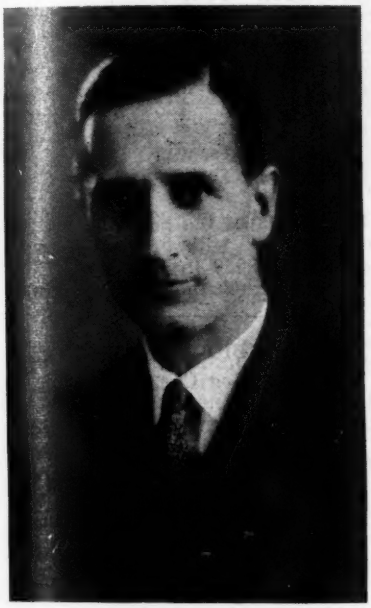
The objective in designing the machine has been to produce a revolving steam shovel of the 1¼-yard class suitable for the heavy work that it will be called upon to do without in any way sacrificing its speed, simplicity, or ease of operation. Specifications and further details may be obtained by addressing the Osgood Company at Marion, Ohio.

The National Slag Company announces the removal on October 1 of their Philadelphia office to room 1000, Jefferson Building, 1015 Chestnut Street, Philadelphia, Pa.

The Cement Products Corporation, East Jersey and Front Streets, Elizabeth, N. J., has been incorporated for $125,000 for the manufacture of cement blocks, tile, etc.

Bakstad Heads New Company

J. R. Bakstad, widely known in this industry, has resigned as manager of the branch office sand and gravel business of the Good Roads Machinery company, Kennett Square (Philadelphia), Pa., to engage in business for himself under the name of the Bakstad Machinery company. The offices of the new concern are in Suite 1168, Peoples' Gas building, Chicago.



Mr. John R. Bakstad.

The aims of the Bakstad company, according to its chief, are to design and completely equip sand and gravel plants.

Prior to his resignation Mr. Bakstad was for five years manager of the sand and gravel department of the Good Roads Machinery company in the central west, with headquarters in Chicago. His territory comprised 28 states.

Since 1912 Mr. Bakstad has had practical experience in relation especially to sand and gravel and to stone crushing plants. A large part of his knowledge of this industry was gained while in the employ of the United States Metals Refining company. He was in charge of the stone crushing plants of that concern.

Among the important plants which Mr. Bakstad designed while with the Good Roads Machinery company are the Appleton (Wis.) Sand and Gravel company, Elkhart Sand and Gravel company (Elkhart Lake, Wis.), Sheboygan County (Wis.), Brantford (Ontario) Sand and Gravel company, and E. C. Skinner and Company, Four Mile Creek, James River, Virginia. The latter two are among Mr. Bakstad's recent achievements.

New Clutch and Pulley Catalogues

W. A. Jones Foundry & Machine Company of Chicago, Ill. announces the recent publication of two catalogues. Catalogue No. 27 is devoted to the subject of pulleys and is full of new and valuable information on cast iron pulleys, such as, weights, illustrations, and extra lists for special types together with rubber covering lists and also describes, illustrates and lists Lemley ball bearing loose pulleys. Steel, wood and paper pulleys are also listed.

Catalogue No. L-28 takes up the subject of friction clutches. This is a book of 56 pages of various data on Lemley friction clutches most of which is entirely new. Sleeve clutches, cut-off couplings, clutch pulleys, ball bearing clutch pulleys, and gas engine clutch pulleys are completely covered with price lists, dimensions, illustrations horsepower ratings, etc.

Interested parties may obtain either or both of these catalogues free by writing to W. A. Jones Foundry & Machine Company, 4401 West Roosevelt Road, Chicago, Ill.

L. P. Green Moves

Announcement is made by L. P. Green, manufacturer of Green power drag scrapers, that the offices of his organization have been moved from the Lumber Exchange to 1250 Monadnock Block, Chicago. The quarters in the Monadnock are larger than those occupied up to this time, and it is believed that, with these enlarged quarters, it will be possible to extend to users and prospective users of Green equipment even better service than they have enjoyed in the past. Mr. Green reports that sale of his equipment, including power drag scrapers and steam, electric and gasoline hoists is double that of last year.

New Brown CO_2 Meter

At the recent chemical show in New York City, the Brown Instrument Company of Philadelphia exhibited a new CO_2 Meter which measures electrically the percentage of CO_2 in flue gas. This instrument works on the principle of the difference in the thermal conductivity of various gases instead of on the principle of chemical analysis. This principle of difference of thermal conductivity of various gases has been known for some time but not until recently has any commercial use been made of it. While this type of instrument has been developed abroad, and a few imported instruments have been sold in this country, the Brown company is the first to produce equipment of this nature in America.

The device operates electrically and permits of indicating and recording the CO_2 percentage at any distance from the boiler and shows the percentages continually and not as a result of the analysis of separate samples. Accuracy of the instrument is one-half of one per cent.

Complete information may be had by writing the Brown Instrument Company of Philadelphia, Pa., for a copy of catalogue No. 30.

Blaw-Knox Buffalo Office

The Blaw-Knox Company of Pittsburgh announces the opening of a Buffalo, N. Y., Office at 622 Genesee Building.

Mr. J. C. McQuide has been transferred from the Pittsburgh Organization as Manager of the Buffalo Office.

The Buffalo Office will now serve Northern & Western New York and adjacent territory and is in position to give immediate and direct service in connection with the well-known Blaw-Knox products, including road building machinery, clamshell buckets, forms, sectional steel buildings, structural steel, etc.

New Haiss Truck Loader

The George Haiss Manufacturing Company, Inc., of New York City, announces a new model of the Haiss Creeper Truck Loader.

Improvements and refinements have been made at many points in the machine to give easier operation, greater strength and capacity, and particularly lower up-keep expense.

The time-tried and proven principles of operation, steel plate feeding propellers, 2′ crowding speed, toothed buckets, completely enclosed transmission and clutches, remain the same. The changes consist of improvements, refinements and increased size and strength in detailed parts.

The operation record of one of the machines of the new model is cited as of interest. This machine consistently loaded six yards of 2″ gravel in three minutes, and got out 41 such loads, or 246 yards on eight gallons of gasoline.

Some idea of the size and power of this machine will be had from its weight of 14,000 lbs. and its 37 H.P. Waukesha truck motor power plant.

Motorbloc Literature

The Motorbloc Corporation of Philadelphia in its new bulletin S-101 describes and illustrates the operation of Motorbloc in several capacities which have been developed as a result of 18 years of experience in the material handling field. The principal features of value that the manufacturers claim for the Motorbloc are lightness and portability and a motor operated by a small electric motor built into a compact unit. It can be used at any place where electric current is available in connection with a Pendant controller that is furnished with it.

Copies of bulletin S-101 and all other literature containing information on the Motorbloc line may be had by addressing the Motorbloc Corporation, Summerdale, Philadelphia, Pa.

The Hancock County Chert Gravel Company, Hawesville, Ky., has been incorporated for $30,000. Incorporators: G. W. Newman, J. R. Skillman, and J. T. Griffith.

Acker Cement Products and Supply Company, Fort Wayne, Ind.; capital, $25,000; building materials; directors: C. W. McKee, E. H. Tielker, F. W. Fielker, Russell Acker.

The Cleveland Stone company of Amherst, Ohio, is expending $175,000 in improvements at its plant at South Amherst.

Barber-Greene on the Job

The photograph here shown is of a Barber-Greene loader which handles a maximum of 250 cubic yards of washed sand and gravel daily at the plant of Pipkorn-Marggraff, Milwaukee, Wis., distributors of Lincoln Washed Sand and Gravel.

Only one man is required to operate the Barber-Greene, and with it he can load a truck with 5 cubic yards in 3 minutes. No helper is needed, as the discs clean up as they feed. No comparison can be made between this and hand labor. It is hardly possible to get enough shovelers around a truck to load 5 cubic yards in 3 minutes.

Barber-Greenes of the same type can also be used for stripping and are successfully employed for this purpose in a number of places. The machine has a record of having loaded plowed earth into trucks making 105 loads of 2¼ yards each in 10 hours. One operator only was required.

Further information on Barber-Greene loaders may be had by addressing the Barber-Greene Company, Aurora, Illinois.

Link-Belt Acquires Meese & Gottfried Co.

Charles Piez, President of the Link-Belt Company, Chicago, announces the purchase of the Meese & Gottfried Co., of San Francisco, Los Angeles, Seattle and Portland.

For the past ten years Link-Belt Company has been distributing its products on the West Coast through its subsidiaries, the Link-Belt Northwest Company, of Seattle, and the Link-Belt Pacific Company, of San Francisco. The improvement in distributing facilities effected by the consolidation, and the additional manufacturing facilities acquired, should give the rapidly-growing industries of the Pacific Coast highly economical and efficient service.

Meese & Gottfried Co., and its predecessors have been manufacturers of power transmission machinery and distributors of conveying and transmission machinery on the Coast for more than forty years, and were well and favorably known from the Canadian to the Mexican border. It is the intention of the new owners, to add to the facilities, and enlarge present stocks, so that prompter service to its customers will be insured.

The new organization will be known as Link-Belt Meese & Gottfried Co., with headquarters at San Francisco. The officials will be:

Charles Piez, Chairman of the Board.

B. A. Gayman, President.

Harold H. Clark, Vice-President and Sales Manager.

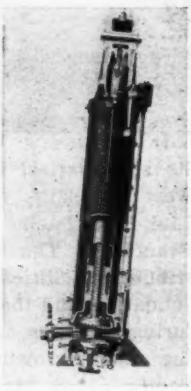
Leslie W. Shirley, Treasurer.

Richard W. Yerkes, Secretary.

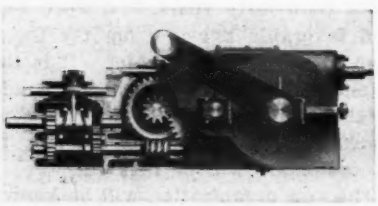
Mr. Yerkes came to Chicago from the Link-Belt Philadelphia plant, as the newly-elected Treasurer and Secretary of the Link-Belt Company.

Van Dorn Dump Truck Hoists

The Van Dorn Vertical and Horizontal Dump Truck Hoists are described in a new bulletin just issued by the manufacturers. Both these products are offered by Van Dorn engineers as improved devices which will speed up loading and dumping and stand the racking strains and rough usage of dump truck servicewith a minimum of operating and upkeep expense. The book throughout shows by text and illustrations the features and advantages of the Van Dorn products. Illustrations include views of the several products applied to trucks, and line drawings illustrate the construction. Specifications of the hoists are also included. The book concludes with listings of Van Dorn dump truck bodies for a wide variety of uses.



Vertical Hoist.



Horizontal Hoist.

Copies of this bulletin may be had by addressing the Van Dorn Iron Works Company, Cleveland, Ohio.

Thew Shovel Literature

Folder 6-23, the second of a series of folders on shovel performance published by the Thew Shovel Company of Lorain, Ohio, contains evidence of the dependability of the Thew machine by going into an analysis of some of the parts that make up that machine. The folder describes the double gears on the Thew shipper shaft which equalizes varied strains; tells of the use of a single stick with only one rack in contact with the single pinion; describes the boom, dipper, A frame and horizontal engines; the boom derricking device and the continuous tread truck are also described.

Illuminating the Night Shift

As autumn advances and the days grow shorter, contractors everywhere are speeding up their work in order to maintain a normal rate of production. One way of accomplishing this result is by working night shifts and illuminating the scene of operation with Carbic portable acetylene lights, made by the Carbic Manufacturing Company of Duluth.

These lights are strictly portable and can be moved from place to place as the job progresses. Because of their flexibility, their light can be thrown in any direction or adjusted to any angle, either vertical or horizontal. Their use in night shifts prevents expensive equipment from "eating its head off" in idleness. With two of these lights stationed at each end of the work, cross shadows are avoided, although on some jobs a single standard Carbic light has afforded ample illumination.

The use of acetylene for portable lights has been greatly simplified by the use of Carbic cakes made of briquetted carbide which, with water, are used as fuel in Carbic lights. There are only three parts to this light which the manufacturer claims cannot be wrongly assembled. They slip easily together and the lights may be operated with safety by the most inexperienced labor.

Full information may be secured by addressing the Carbide Manufacturing Company, Duluth, Minn.

KENNEDY BALL BEARING GEARLESS CRUSHERS

WHY THEY LEAD

1—They are noiseless and run like watches.

2—50% greater capacity for same power.

3—Practically no wear on anything but head and concaves.

4—Short shaft and saving in head room with packed dust collars.

5—Shaft reinforced with self-locking head so that it cannot break where 90% of shafts have broken.

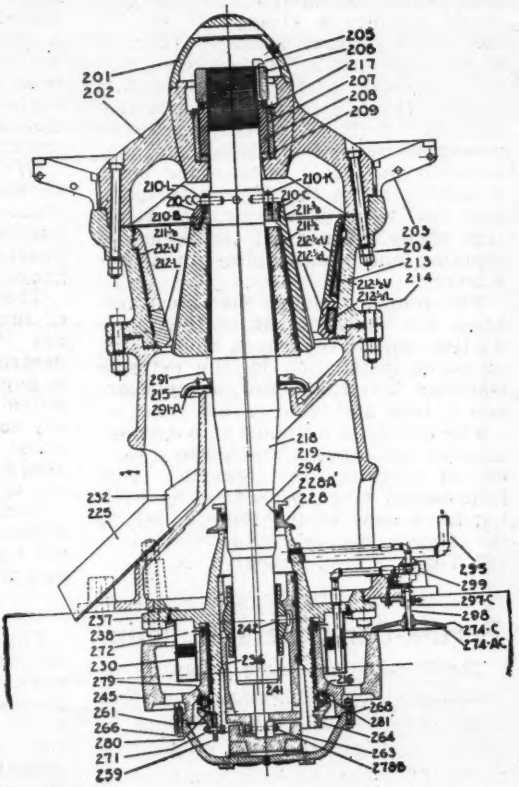
6—Can be driven right, left, or standard, as sent from shop.

7—Eccentric is turned by flexible coupling attached to pulley, which prevents side thrust and heating, as in geared crushers.

8—Ball and socket eccentric, self-aligning, eliminating friction and heating. Runs for years without attention.

9—Positive circulating oil system through filter and cut geared oil pump.

10—Made in our own shop by experts, trained for the job.



11—It is a crusher with the trouble left out. See it in operation, and you are unfit to listen to any geared crusher salesman. In fact, if you are near one of his machines, you can't hear him, if you were so inclined.

12—Our fine crusher does the work of 4 geared crushers.

Send for catalogue and tell us what your problems are, and one of our experts will call on you without obligation on your part.

KENNEDY VAN SAUN MFG. & ENGR. CORP.

50 Church St. **NEW YORK**

CIE. DES. ENTERPRISES INDUSTRIELLES, PARIS

Hauck Venturi Oil Burner

The Hauck Manufacturing Company of Brooklyn, N. Y., in its new Bulletin 506, just off the press, describes in detail the Hauck Venturi low pressure oil burner which is designed to burn fuel oil at air pressures from 8 oz. to 2 lbs. This burner is the result of many years of oil burner experience and of the efforts of Hauck engineers to develop a burner that would produce a clean, intense, yet soft soaking flame under full control of the operator. The engineers also set themselves to devise a burner that would insure perfect combustion through perfect atomization and proper air regulation, that would light instantly on a cold furnace and bring it quickly up to the desired temperature, that would be of sturdy construction, easily taken apart and permit of cleaning and reassembling in a few minutes.

The company claims that these features are incorporated in their production and have proven their value in every installation by the extreme economy in air and oil consumption, and in time and labor saved.

The burner is designed in a number of sizes and types adaptable to a variety of operating requirements. Full information may be secured by writing for a copy of the Bulletin 506 to the Hauck Manufacturing Company, 126 Tenth Street, Brooklyn, N. Y.

Bertha-Consumers Bulletin

The Bertha-Consumers Company of Pittsburgh, Pa., publish an interesting house organ, which the producers in the pit and quarry fields might find a benefit. The various numbers of the bulletin touch upon the use of coal in some of the principal industries including one or two in this field. From time to time there are also included articles on various kinds of coal and information on the coal trade in general.

The bulletin is attractively printed in two colors, and the issues are well illustrated. Copies may be had by addressing the Bertha-Consumers Company, 1203 Chamber of Commerce Bldg., Pittsburgh, Pa.

New Biehl Catalogue

Clad in blue and embellished by gilt, the latest catalogue (No. 9) of the Biehl Iron Works, Inc., of Reading, Pa., has been distributed to the trade. The catalogue, which supersedes all previous issues, shows and describes types of the company's production of industrial cars and equipment.

The booklet begins with a numerical index as to illustrations and an alphabetic index of descriptive content. A feature of the pamphlet is the page on which is listed the various industries which the concern serves. These businesses range from the manufacture of asbestos to that of zinc and include of course the pit and quarry.

Of value to the trade is a table showing the weight of various substances by the cubic foot. The last page in the catalogue shows various phases of the United States standard gauge.

The book shows almost every type of dump or other industrial car. These are well illustrated and clearly described. The Biehl "V" dump car is depicted as of peculiar value in relation to the carriage of saturated and dry sand, gravel and rock. Diagrams show the operation of the concern's heavy standard side dump car; a table of dimensions is also given.

Various types of ore tubs, buckets, strips, carts, barrows, furnaces, heaters and like devices are ably described and well pictured.

The Arrowhead Portland Cement, capitalized at $2,000,000, has begun work on its plant at Cajon Pass, San Bernardino County, according to W. A. G. Bravender, President and General Manager of the new concern. Limestone and shale deposits extending over 600 acres are at Devore, 11 miles from San Bernardino. The company also owns 160 acres of high-grade gypsum at Moapa, Nevada. It is expected that the plant will be put in operation about the first of the year and that production will be at the rate of 1,000,000 barrels per year. The "wet process" will be employed. Mr. Bravender has been engaged in the cement business since 1888. He has supervised the building of seven mills, and is said to have made and introduced the first barrel of Portland cement in Canada. Others interested in the new company are H. D. McPhail, Vice-President, Los Angeles.